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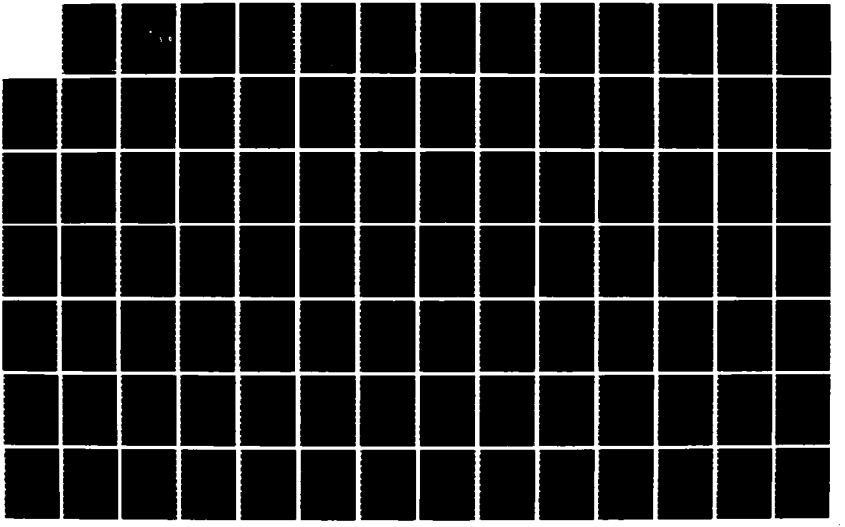

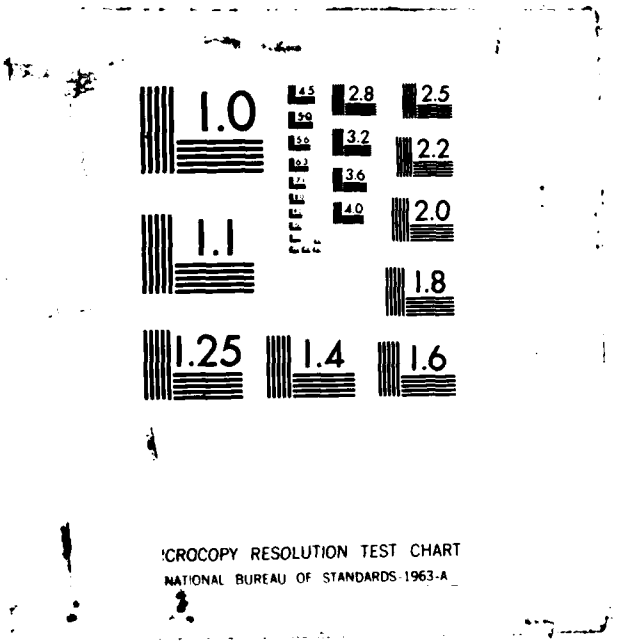

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

AN IMPLEMENTATION GUIDE FOR THE EXPERIMENTAL APPLICATION OF SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING TO THE COAST GUARD TRAINING ENVIRONMENT

by

James Dennis Williamson

June 1986

Thesis Advisor: Richard A. McGonigal

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REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b DECLASSIFICATION / DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b. OFFICE SYMBOL (If applicable) Code 54	7a. NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c. ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	7b. ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000
8a NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification) AN IMPLEMENTATION GUIDE FOR THE EXPERIMENTAL APPLICATION OF SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING TO THE COAST GUARD TRAINING ENVIRONMENT

12 PERSONAL AUTHOR(S)
Williamson, James D.

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	1986 June	110

16 SUPPLEMENTARY NOTATION

17 COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Suggestive-Accelerative Learning and Teaching (SALT), Neuro-Linguistic Programming (NLP), Training Methodologies

19 ABSTRACT (Continue on reverse if necessary and identify by block number) This document addresses the compatability of Suggestive-Accelerative Learning and Teaching (SALT) with two models of brain function, those of Program Structure (Proster) theory and Neuro-Linguistic Programming (NLP). The suggestive-based models for the acceleration of learning, Suggestopedia and Suggestive-Accelerative Learning and Teaching (SALT), are reviewed and the conclusion is drawn that the acceleration of learning, evidenced by the application of Suggestopedia and SALT, is due to their compatability with brain function.

An implementation guide for the use of the SALT in the U.S. Coast Guard training environment is presented. An experimental design for the application of SALT to the U.S. Coast Guard Emergency Medical Technician School curriculum is proposed. Considerations for this application experiment are reviewed including: class schedule changes, course design, classroom set-up, instructor training requirements, and additional training equipment necessary for experimentation.

20 DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL Richard A. McGonigal	22b TELEPHONE (Include Area Code) (408) 646-2186 22c OFFICE SYMBOL 54Mb

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

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An Implementation Guide for the Experimental Application of Suggestive-Accelerative Learning and Teaching to the Coast Guard Training Environment

by

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
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ABSTRACT

thesis

This ~~document~~ addresses the compatability of Suggestive-Accelerative Learning and Teaching (SALT) with two models of brain function those of Program Structure (Proster) theory and Neuro-Linguistic Programming (NLP). The suggestive-based models for the acceleration of learning, Suggestopedia and Suggestive-Accelerative Learning and Teaching (SALT), are reviewed and the conclusion is drawn that the acceleration of learning, evidenced by the application of Suggestopedia and SALT, is due to their compatability with brain function.

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TABLE OF CONTENTS

I. INTRODUCTION

At the turn of the century William James formulated the hypothesis that the individual functions at ten percent or less of one's true potential . (Otto, 1968, p. 3) The question of how to tap into the unused potential of the individual is one of importance in a world where information and knowledge is expanding at an ever increasing rate. The realization that only a fraction of an individuals potential is used is not enough to improve the use of individual potential. Methods that help the individual to tap into this reserve capacity are available however. The discovery of the Pygmalian Effect (Rosenthal & Jacobsen, 1968) in the American classroom showed that the expectation of a teacher can have a profound effect on the learning abilities of students. How this expectancy effects the student and an operational model for increasing learning was not developed by these researchers unfortunately. (Jones, 1971, p. 107)

Today suggestive-based teaching has operationalized the Pymalion Effect. When applied in the classroom it has proven that a dramatic acceleration in learning is possible with increased long-term retention of the material learned. This methodology if applied to the Coast Guard training environment could prove to be a very cost effective and efficient means of improving the quality of training.

A. BACKGROUND FOR THIS STUDY

The experimental and practical use of suggestion to tap the potentials of the brain in a structured educational environment was shown to be effective by a Bulgarian scientist, Dr. G. Lozanov. Through the use of non-hypnotic suggestion the Lozanov proved that an individual was capable of attaining a remarkably heightened ability to learn in a waking state. Other research conducted in the area of brain function and neuroanatomy, and models which operationalize these findings, theorize that by complying with the brain's needs enhanced learning is possible.

B. OBJECTIVES AND RESEARCH QUESTIONS

The objectives of this study are to:

1. Gain an understanding of how acceleration of learning could be explained based on process theories of brain function.

2. To ascertain whether this method could be applied to the Coast Guard training enviroment and, if so, what would be required to implement experimentation of accelerated learning in this environment.

Specific questions related to these objectives needed to be answered before an analysis could take place. These questions were:

1. Could the internal and external processes outlined in Lozanov's work be correlated to the recent findings of neuroanatomy and brain function?

2. What work had been done to make the recent theories on brain function operational in the educational setting?

3. How did the process models of brain function relate to the claims of accelerated learning and are they useful in helping to understand the theoretical basis of suggestive-based training metodologies?

4. If the method had a solid theoretical base could it be adapted to use in the Coast Guard training environment?

5. What training was necessary for this instructor intensive model to be effective?

6. What other resources were necessary to allow application of the theory to training in the Coast Guard?

C. SCOPE, LIMITATIONS, AND ASSUMPTIONS OF THIS STUDY

The scope of this research was broad by design. The need to clarify the theoretical base of accelerating learning by relying on physiologically based models of brain function was paramount. Explanation of hypnotic and waking state suggestion was not attempted by this study as a thorough review of literature on these subjects has been completed. (Philpov, 1975) The assumption that the claims of suggestive-based learning were explainable in terms of brain structure and function was made. This assumption was made in an attempt to demystify the use of suggestive-based techniques in training. To achieve this end an investigation was made relying on the findings of researchers who are studying the physical structure of the central nervous system and those individuals who have developed models based on this work.

The actual application of a suggestive-based learning paradigm in the Coast Guard training environment was beyond the scope of this study. The application, of the techniques outlined, to training within the Coast Guard is left to future researchers with the hope that the findings of this research will assist in their application.

D. LITERATURE REVIEW AND METHODOLOGY USED FOR THIS STUDY

This research rests on the work done in the areas of the neurophysical and neuropsychological findings and models of a number of researchers. An extensive review of literature was made of learning, and information processing models that have been developed based on these findings. Two models were found to be especially useful in gaining an understanding of how the individual inputs, stores, and recalls information that can be applied. These models are reviewed and their implications to the training environment are explained. These models are the Program Structure (Proster) model developed by L. Hart (1975) and the Neuro-Linguitic Programming (NLP) model developed by R. Bandler & J. Grinder (1975). These models proved helpful in understanding how the mechanism of Lozanov's Suggestopedia and it's Americanized version, Suggestive Accelerative Learning and Teaching (SALT), can lead to accelerated learning in the classroom.

E. SUMMARY OF FINDINGS

The use of suggestion in the training environment should enhance the ability of the students to learn quickly and easily. The theoretical basis for the use of non-hypnotic suggestion in the classroom setting rests on solid neurophysical and neuropsychological findings related to human potentialities. (Hart, 1975, 1983; Lozanov, 1978, 1979; Otto, 1968; Ornstein, 1972, 1974; Rosenfeld, 1977; Russell, 1979)

The application of suggestive-based training is well within the capabilites of the structured training environment of the Coast Guard. The successful application of these proven methods should allow the Coast Guard to realize an increase in the effectiveness and efficiency of training.

F. ORGANIZATION OF THIS STUDY

A presentation of the findings of human neuroanatomy and the structure of the brain will be made, focusing on the major regions of the brain and their features of control and intergration of information storage and retrieval. The Proster Model of brain function and it's implications to the educational environment will be presented. Additional insight into the input, storage, and retrieval of information as formulated by the NLP Model will be gained. Important implications for the classroom presentation of material drawn from the findings of this model will be disclosed. The

Suggestopedic model and it's theoretical tenants will be presented next along with the suggestopedic cycle for the presentation and practice of classroom learned material. Changes to the model by American researchers will be identified and the results of research which has been conducted will be presented.

A recommendation will be made for a Coast Guard training curriculum that may be used for future experimentation with a suggestive-based training methodology. Training of suggestive-based instructors will be discussed and any necessary changes to the physical setting of available classrooms will be identified.

II. REVIEW OF LITERATURE

Before presenting the suggestive-based theories of instruction and describing their application a review of brain function will prove helpful. The objective of this review is to assist in understanding how the neurological processes can explain the acceleration of learning evidenced by the suggestive-based teaching models. Following a review of neuroanatomy two process models of brain function, the Program Structure (Proster) and Neuro Linguistic Programming (NLP) Models, will be examined. With these models as a foundation the Suggestopedic and Suggestive-Accelerative Learning and Teaching (SALT) paradigms will be presented.

A. HUMAN NEUROANANTOMY

Although, the purpose of this research is not to give a dissertation on the physiological storage within the brain, it is necessary to outline human brain function to better understand the process models which will be presented.

1. The Neuron Connection

The human brain is an immensely complicated information input, processing, and output center. It has been estimated that there are between ten and thirty billion neurons, or more, in the human brain (Hart, 1975, p. 39) each interwoven and connected with numerous other neurons which form a network for the storage and retrieval of information.

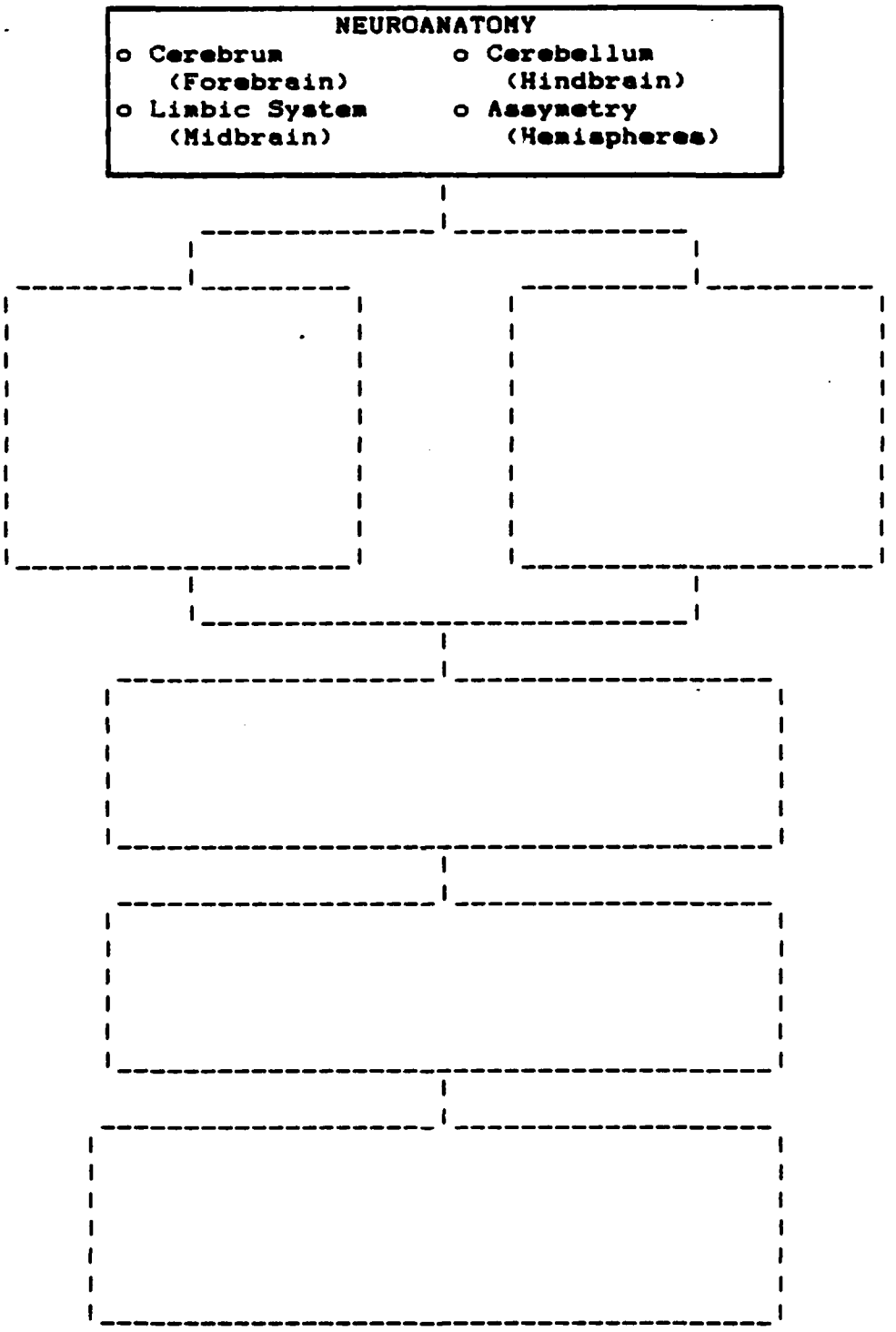

NEUROANATOMY
o Cerebrum (Forebrain)
o Limbic System (Midbrain)
o Cerebellum (Hindbrain)
o Assymetry (Hemispheres)

Figure 1

A neuron in the cortex of the brain may be coupled with up to ten thousand other neurons through a system of connecting synapses. (Russell, 1979, p. 33)

The typical neuron consists of a cell body and axon covered by a myelin sheth (see Figure 2). The axon is generally considered the carrier of outgoing information while the myelin sheth acts as an electrical and chemical insulator for the axon and helps to speed pulses from one neuron to other neurons. The axon has a number of fibers at its end which are known as dendrites, these dendrites resemble the tree like structure for which they are named (dendron is Greek for tree). The dendrites connect directly with other neurons or other dendrites through the synapse. It is at this point that information is transfered to other brain cells at the molecular level (Russell, 1979, p. 33). Evidence exists that shows an increase in environmental stimulation has an impact on the number of nerve cells produced by the brain and the number of connections between the nerve cells. The more varied and rich the environment the more likely it is that the network of information storage and access will operate at maximum efficiency. (Restak, 1979, p. 104)

It has also been theorized that the particular firing patterns of the neurons through the synaptic connections are necessary to recall a particular memory. The triggering of a chain of neuronal firing would result in the activation of

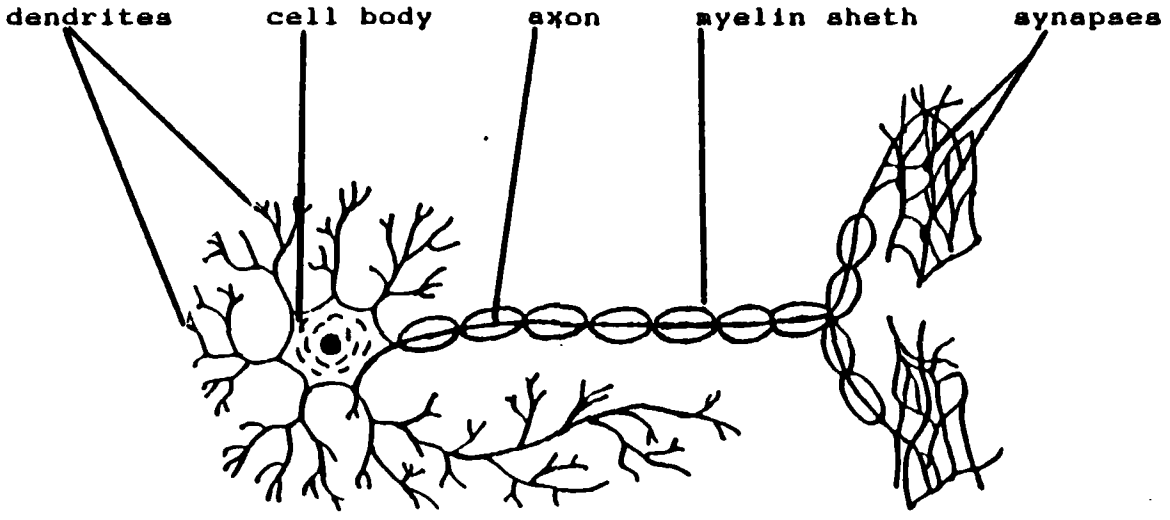


Figure 2

Simplified Diagram of a Typical Neuron.
(Russell, 1979, p. 35)

Electrical charges are recieved from other cells by the dendrites. Their overall effect on the cell body governs the rate at which impulses are sent out via the axon and transmitted to the dendrites of other cells at the synapses.

the long term memory store. (Rose, 1973, p. 212) Control of neuron firing is what allows the individual to recall past events and to access information for performance of tasks, whether intellectual or physical.

Holding the neurons of the brain together are 100 billion glia cells which make up the white matter of the central nervous system. They provide nourishment for the neurons and carry away waste chemicals caused by the neural firing at the synaptic gaps between the neurons and dendrites. These cells also insulate the neurons and are the source of the myelin coating that covers the fibers of the brain. The glia cells also act as the foundation material for the neuron rich cortex structure which rests on the surface of various portions of the brain. (Russell, 1979, pp. 40-41)

2. The Cerebrum

The cerebrum, sometimes referred to as the forebrain, is the largest portion of the brain and sits atop the functionally diverse midbrain and hindbrain. The vast majority, seventy five percent, of all of the brains neurons are located in the cortex of the cerebrum. (Restak, 1979, p. 44). The cerebrum consists of two hemispheres which are connected by a large number of nerve fibers known as the corpus collosum. The corpus collosum acts as a communication link between the hemispheres of the cerebrum allowing information processing to take place in both of the hemispheres of the cerebrum cortex.

The grey matter of the cerebrum rests on the surface of the brain, and is referred to as the cerebrum cortex or neocortex. Within this neocortex the higher order skills of the brain are resident and have been found to be somewhat localized hemispherically (see Figure 3).

The cerebrum cortex is that area of the brain most responsible for the functions of abstract thought, language, auditory discrimination, somasensory functions, olfactory, visual processes, and motor control related to the higher functions. In some areas of the cerebrum cortex specificity of function disappears and an overlap of the sensory specific parts results. The ability to associate sensory specific information of the various zones of the cerebrum cortex to those of another sensory specific zone allows the brain to form perceptions of objects "by a constellation of memories compounded from several sensory channels". (Springer & Deutsch, 1981, p. 210)

3. The Midbrain

Laying beneath the cerebrum at the top of the brain stem is the thalmus, a relatively large region, which acts to relay information from the sensory organs to the cerebrum and from one area of the neocortex to other cortical zones. As a switching center, the midbrain, has been found to be much more complete and brain unifying than was formally believed. (Hart, 1975, p. 67)

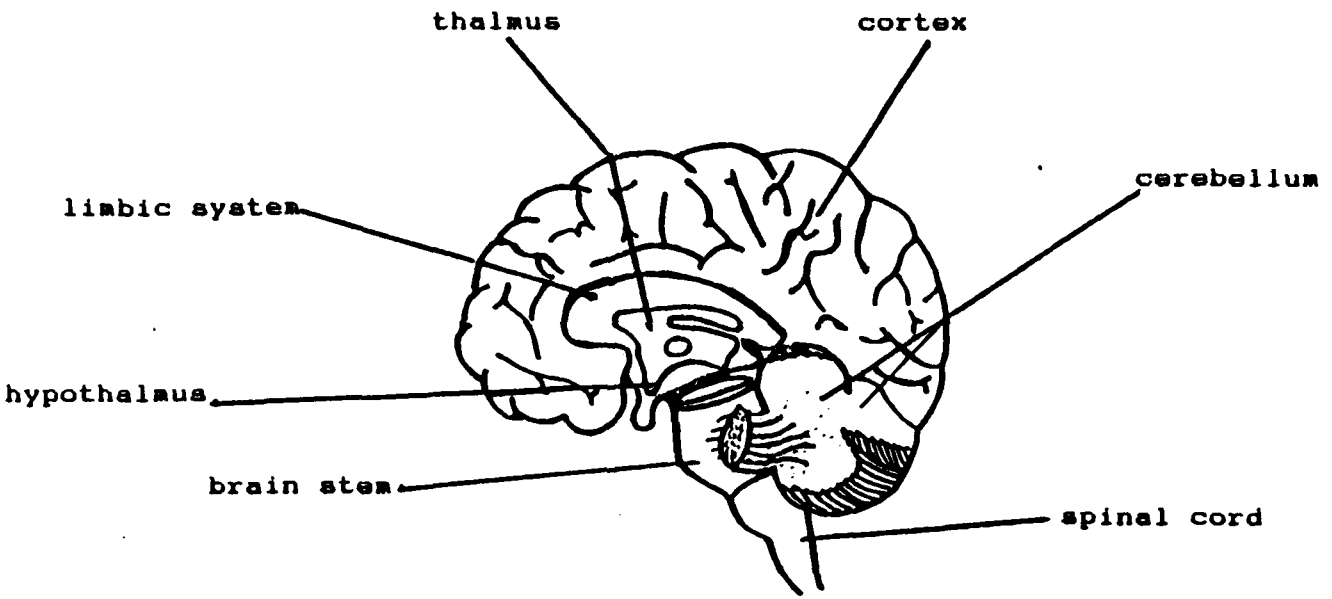


Figure 3

Main Regions of the Brain
(Russell, 1979, p.43)

Just below the thalmus is the hypothalmus which monitors the bodies homeostatis. The feedback loop ensures that the bodies balance is maintained and working at optimum. (Russell, 1979, p. 44)

Surrounding this area is the limbic system, or border area, which in combination with the other areas of the midbrain, has been shown to control emotions and motivation. The limbic system can be thought of as controlling "the four F's--feeding, fighting, fleeing, and sexual behavior" (Restak, 1979, p. 49). Generally the limbic systems control of the homeostatic balance can be thought of as automatic and relatively uncontrollable, that is outside of conscious awareness. (Restak, 1979, pp. 282-283) It is becoming increasing clear, however, that through training the individual can control, what was until recently considered to be, the uncontrollable functions of this autonomic nervous system. (Ornstein, 1972, pp. 192-198)

In general the midbrain works without noticable implications until the individual is threatened. If the threat is of a nature that the system is activated the individual may be limited in the ability to react with their higher brain functions in use. The midbrain has the ability to cut off information transfer to the rest of the brain, or at least severely restrict it. This trait of inhibiting the flow of information allows more immediate action to be taken to avoid a threat thus insuring survival. While this

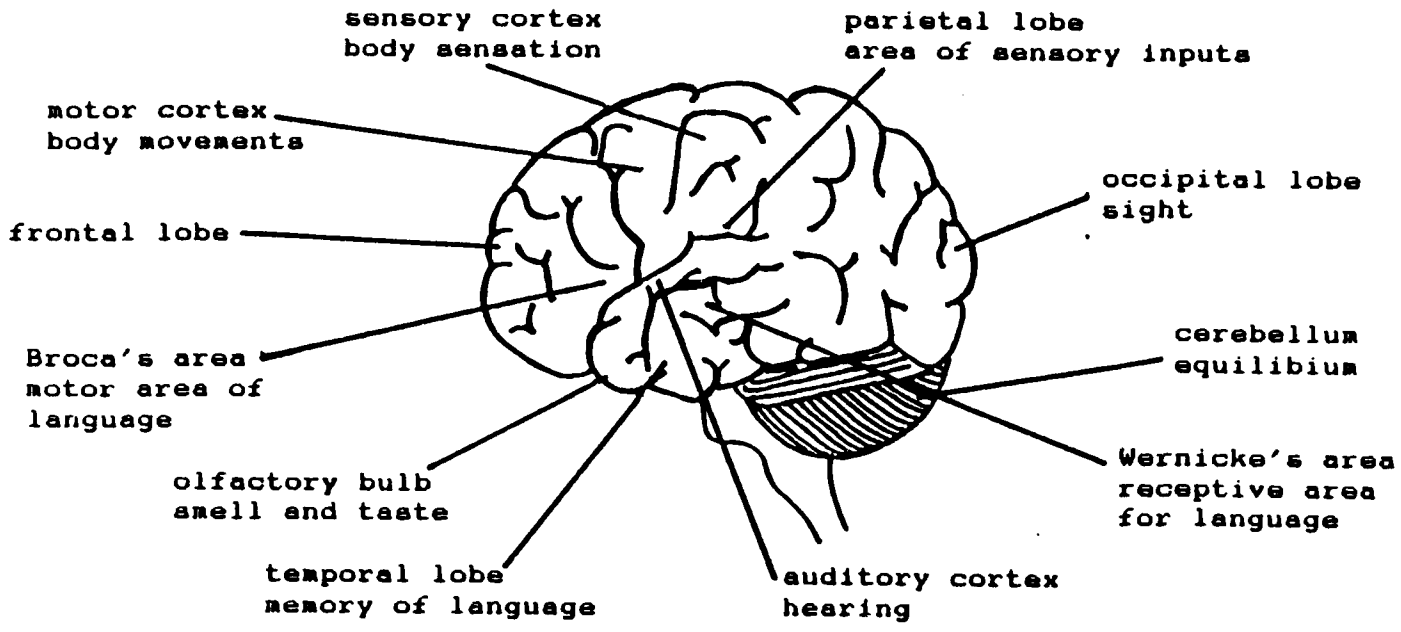


Figure 4

Areas of the Cortex
(Russell, 1979, p. 45)

operation is designed to protect the individual it can interfere with higher cortical function and can effectively shunt the information processing and control abilities of the cerebrum cortex out of the feedback loop. This allows the emotional and homeostatic control centers of the midbrain to become the major player in directing the actions and reactions of the individual.

A typical example of this shunting action might be an inexperienced public speaker who is preparing to present a speech before an audience for the first time. The individual may prepare long and hard for the presentation and feel a great deal of confidence in the knowledge (cerebrum cortex storage) possessed about the subject. The individual may even be relaxed just prior to his or her talk. The moment arrives to get up and actually perform and reactions such as increased heart rate, a rise in blood pressure, sweaty palms, and a stomach full of butterflies results. These symtomatic reactions are difficult, if not impossible, to control and lead to discord in the interaction between the cortical functions of speaking and the limbic system's desire to flee and prevent exposure to a percieved threat. Whether rational or not the limbic system has shunted out the now unresponsive cortical regions of the brain and has restricted the ability to use the brains higher thought and control centers. Notice the threat does not have to be objectively real or life threatening. This is often a totally subjective

perception that will have a major impact in the ability of an individual to send and recieve information that will allow a rational response. This obviously has an impact on an individuals ability to use the cortical structure of the cerebrum to interact with and learn from their environment when threat is percieved.

4. The Cerebellum

The cerebellum rests at the base of the cerebrum and is directly connected to the brain stem and is partically covered by the rear of the cerebrum cortex. It is deeply folded and has its own neuronal structure which is much like that of the cerebrum cortex. Its main function appears to be that of producing smooth coordinated movements of the body. (Russell, 1979, p. 43-44). In addition the cerebellum is connected to the limbic systems emotional control centers and is suspected of playing a role in emotional development. (Restak, 1979, p. 126, 215)

5. Asymmetry of the Brain

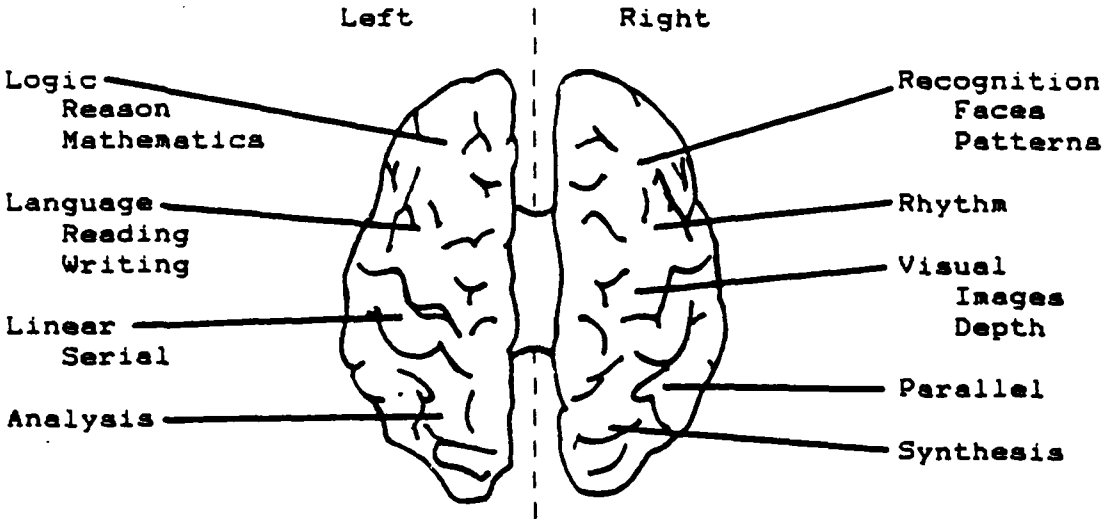
Much has been written concerning the hemispheric specialization of the cerebrum cortex and other portions of the brain and the implications of this specialization. As stated above the cortex consists of to hemispheres which are connected by 200 million nerve fibers of the corpus callosum.

In studies of split-brain patients, individuals who have had their corpus callosums as well as other commissures of the brain severed due to intractable epilepsy, functional

specialization of the hemispheres has been found. (Springer & Deutsch, 1981, p. 26, 30)

The left hemisphere, which controls the right side of the body, has been shown to have a greater affinity for analytical and verbal rather than the relational or a spatial mode of perception. (Ornstein, 1972, p. 57) The right hemisphere shows a greater ability to relate in a holistic spatial mode and to work on non-verbal tasks (see Figure 4).

The findings of the hemispheric specialization within the brain led to ideas of relational speciality of function by investigating how information is processed in each hemisphere. Work with split-brain patients has shown that each hemisphere is capable of handling many of the same tasks. The difference in both approach and efficiency of processing is what has made hemispheric specialization noteworthy. With the exception of language, which appears to be left hemisphere specific, any human behavior or higher mental function involves more than the actual specialties of either hemisphere and utilizes the abilities of both. (Springer & Deutsch, 1981, p. 59) While it is overly simplistic to talk of educating only the left-brain or the right-brain, because of this duality of information processing, inferences can be made that course design and classroom activities need to bring the strengths of both the linear/analytic and spatial/holistic processing of each



Specialization of the Left and Right Hemispheres
(Russell, 1979. p. 54)

Left	Right
Intellect	Intuition
Convergent	Divergent
Intellectual	Sensuous
Deductive	Imaginative
Rational	Metaphorical
Vertical	Horizontal
Discrete	Continuous
Analytical	Holistic
Objective	Subjective
Successive	Simultaneous
Logical	Gestalt
Explicit	Implicit

Descriptive Dichotomies of Consciousness
(Springer & Deutsch, 1981, p. 186)

Figure 5

hemsiphere to better use. Various presention methods, that allow these strengths to be used equally, can only improve the learning which takes place in the classroom.

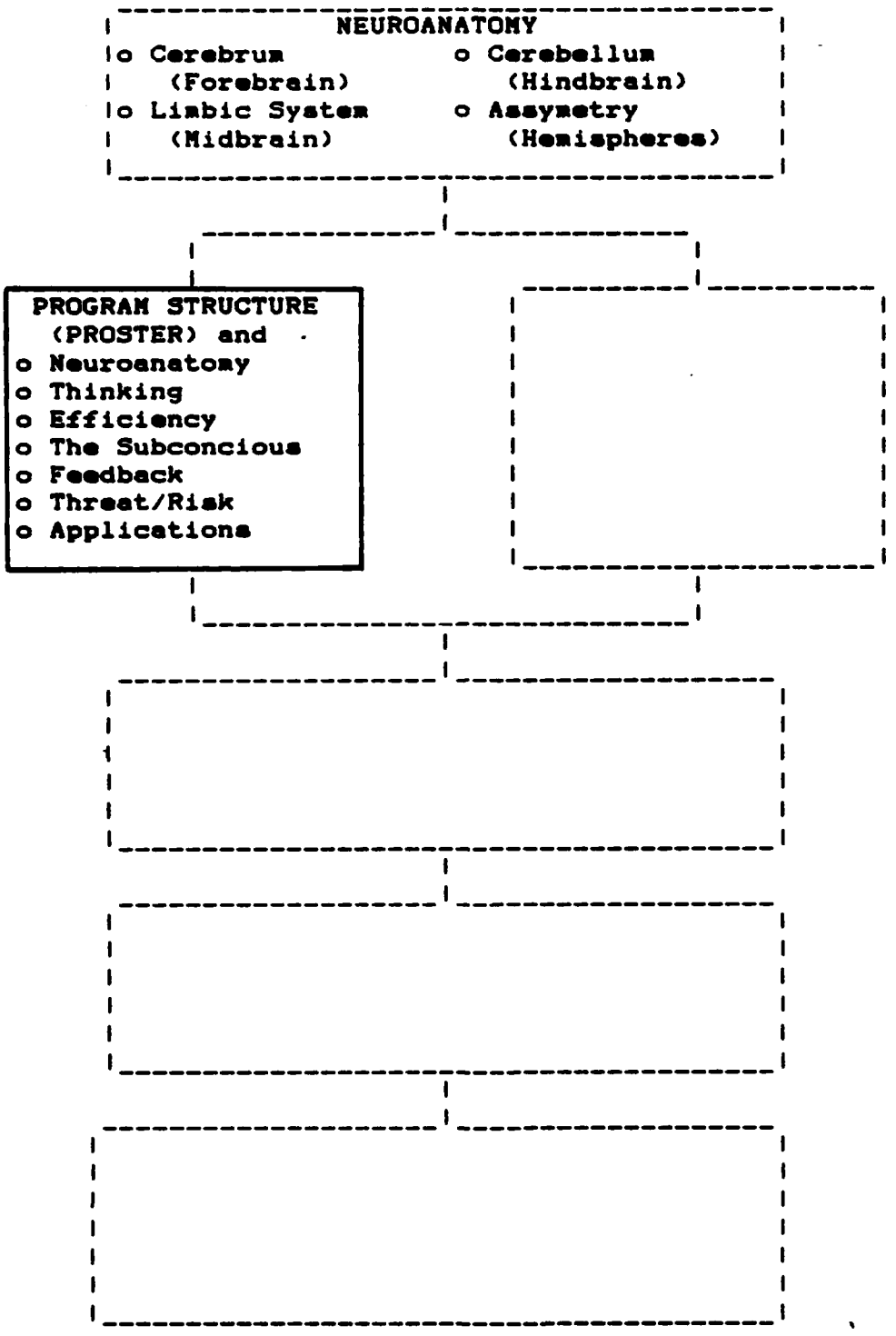
6. The Brain as a Unified System

An examination of the physical structure of the brain is useful in gaining an understanding of how the individual processes information. The tendency to isolate the various functional areas without maintaining a view of the interrelations of these areas must be guarded against.

Models of brain function which take into account the recent findings of neurophysiology and maintain a holistic approach are necessary if their useful applications to the learning environment are to be made. One model which has these necessary attributes is the Program Stucture or Proster Model of brain function.

B. THE PROGRAM STRUCTURE (PROSTER) MODEL OF BRAIN FUNCTION

The Program Structure or Proster Model of human brain function attempts to explain how the individual interacts with the environment and learns in terms of a hierarchical network of programs within the brain. While the model is not neurologically or eletrochemically detailed it is true to the findings of the physical structure of the brain, which have been reviewed thus far, and can be used to explain many complicated features of human behavior and learning. (Hart, 1975, p. 72) Proster theory looks at the brain as a system,


NEUROANATOMY
o Cerebrum (Forebrain)
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o Cerebellum (Hindbrain)
o Assymetry (Hemispheres)
PROGRAM STRUCTURE (PROSTER) and
o Neuroanatomy
o Thinking
o Efficiency
o The Subconcious
o Feedback
o Threat/Risk
o Applications

Figure 6

"considering its interelations, rather than trying to isolate and focus on one tiny area or function at a time" (Hart, 1981, p. 34).

The brain is presented as a "pattern detecting apparatus" that is "amazingly subtle and sensitive" (Hart, 1981, p. 60).

1. Three Brains in One

The Proster model recognizes that the three neuro-physiological divisions of the forebrain, the midbrain, and the hindbrain work together "through a precarious, constantly changing balance of these three partners" (Hart, 1981, p. 38). While recognizing the functions of the cerebellum, of the hindbrain, for motor control, and the limbic system, of the midbrain, with its role in homeostatis and emotion, the cortex of the cerebrum is singled out as that part of the brain where "virtually all of the learning we are concerned with. . .must occur. . . ." (Hart, 1981, p. 38).

2. The Proster and Thinking

A proster may be defined as a grouping of related individual programs, which are the "building blocks or units of behavior" (Hart, 1981, p. 83), each proster has a controlling switching device that is capable of activating a particular stored program. These programs are, inturn, connected with other prosters and thus offer a simplified picture of the complex network of the brain's neuron structure. The conscious activity of throwing the switches necessary to activate a program is what Hart refers to

as thinking. As he states:

> Thinking is defined a basically elaborate switching, with neurons being the brains switches sending activating impulse messages. . .an input signal enters the proster going into the switching device (SD) within which one of several switches (S), but only one at a time can close, thus playing one of the attached programs (Hart, 1978, p. 76).

The theroretical concept of biasing of the information input flowing to the individual proster from other prosters is shown in Figure (6). This bias influences which switch (S) in the proster will be activated and thus which program will be played. (Hart, 1975, p. 84). Current information recieved influences the program selected along with any bias created by past experiences, emotional set, or future goals and ambitions of the individual. (Hart, 1975, p. 84)

3. Efficiency and the Prosters of the Subconcious

Those automatic activities, which an individual performs, are characterized as the subconcious activation of prosters without the conscious throwing of switches. In most cases habitual patterns of activity are merely these prosters operating in a familiar situation without the necessity of conscious thought. Only when one of these prosters is interupted by an unfamiliar situation will the need for conscious attention be necessary. Most often the abortion of a proster will be made evident though an emotional response of frustration or warning. (Hart, 1975, p. 79)

The human brain is capable of carrying out a type of parrallel processing of information within its structure on a

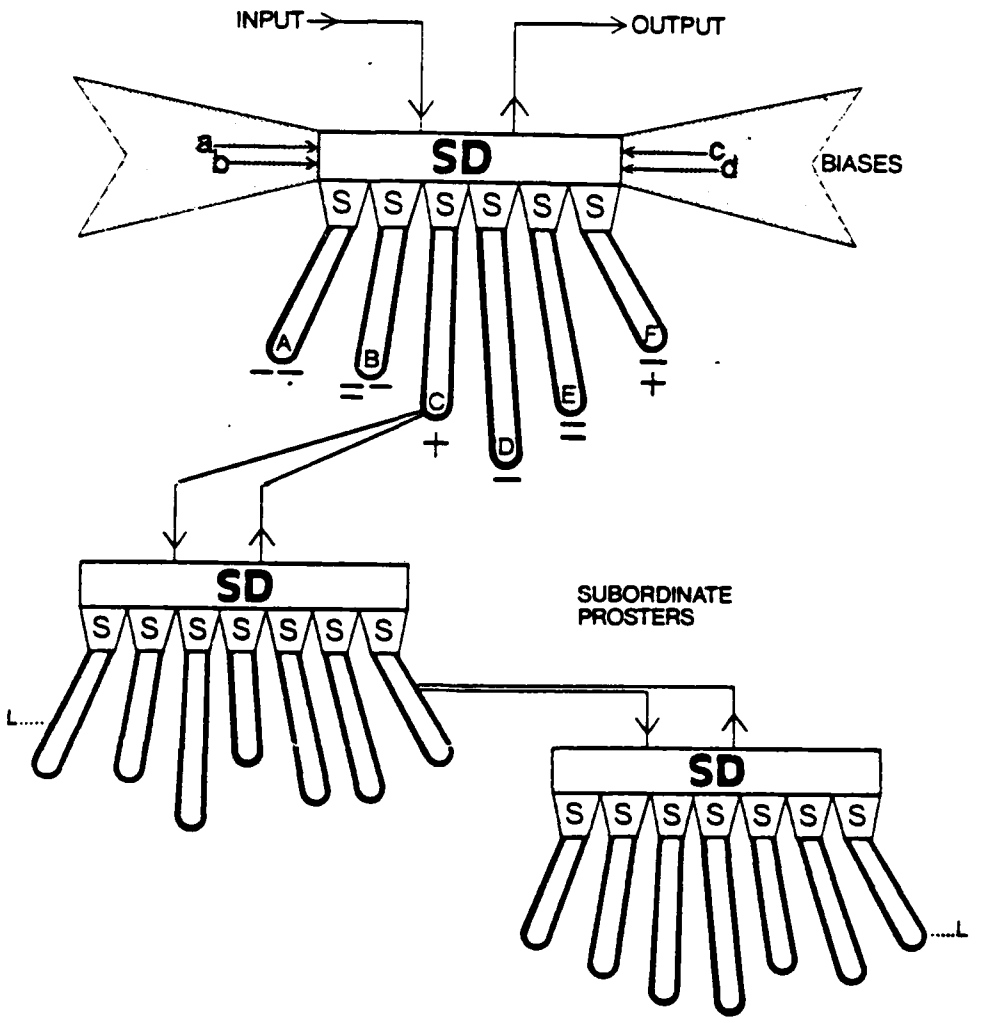


Figure 7

Simplified Conceptualization of the Proster Model
(Hart, 1975, pp. 75, 83)

The homeostatic biases (shown as side inputs) influence which selector switch (S) will be engaged to activate an attached program. The subordinate prosters indicate the networking of prosters throughout the brain. Networking allows the activation of numerous programs simultaneously on both the conscious and subconcious levels.

subconscious level:

> the brain can accept hundreds of thousands of simultaneous inputs and can carry on a host of intricate simultaneous operations. . .this kind of search could be called "prostering" can go on quite rapidly, for practical purposes, because of this simultaneous feature. (Hart, 1975, p. 77)

> an enormous amount of simultaneous categorizing and categorizing down so long as attention is not required and lower-level proster hierarchies are doing the job is possible. Tens of thousands, hundreds of thousands of such processes can go forward literally simutaneously within the brain's billions of neurons and trillions of proster connections, within one mode or much more, usually within several modes. (Hart, 1975, p. 103)

4. Feedback and Prosters

The brain, as an instrument of percieving and dealing with whole situations, requires feedback to insure that the new networks and programs meet a need effectly. This feedback, in the form of situational change, is constantly being evaluated by the brain as it is being modified by the individuals perception of these changes. Learning, as defined by Proster Theory, is the increased networking and the addition of new programs to the proster. This networking is controlled by the quantity and quality of feedback the individual recieves.

> The human brains handling of choice, or proster selection, is in response to continuous differential analysis of the individuals situation as percieved. The changes in the situation are what count, whether induced by external or internal events. (Hart, 1975, p. 95)

Feedback is necessary to allow this differential analysis to take place. Programs are selected and built by doing this analysis and managing response by gradually mastering a

situation. (Hart, 1981, p. 155). New networks of possible reaponaes are built and learning is a result. These processes occur both subconsciously and consciously as information is evaluated within the framework of the complex parallel processor called the brain.

5. Threat and Risk Effects on Prosters

In the neuroanotomical description of the function of the midbrains limbic system the example of a threat reaponae was used to show how the limbic system can shunt input to the cerebrum cortex. The Proster Model holds that this reaponae effectively cuts off the cortical activity. This lack, of active participation of the cortex, keeps the the brain from carrying out the functions of categorizing, networking and addition of new programs. This "downshifting" of mental activity must be minimized to allow full use of the cerebrum cortex rather that the "faster acting, simpler brain resources" of the limbic system. The absence of threat is absolutely essential to effective instruction. (Hart, 1981, pp. 108-110)

Threat can come in various forms in a military training environment. The generalization of poor academic performance in school to the training situation is one such reaction producing memory. Another may be the threat of failure, in either the course as a whole or a particular element of the curriculum such as a test. Embarassment before peers might be another threat producing situation. The arbitrary use of

positon power by an instructor to obtain compliance with requirements may be another. Threat is a relative concept, what may be percieved by one individual as being threatening may seem normal or even exhilerating to another.

While threat has a dysfunctional outcome, in terms of learning, legitimate risk taking and challenge enhance the learning process. There is a qualitative and subjective difference between these concepts which, if managed, can enhance the formation of new programs and proster building. Humans are risk takers in the sense that they have a built in urge to seek excitement, take chances, and subject themselves to new experiences. (Hart, 1981, p. 134) This felt need to voluntarily take risk acts to reset the bias of the inputs to allow new programs to be run and new networks to be formed. By controlling the threat versus risk perception, the individual has of the environment, control of learning is possible. If the environment is percieved as threatening the number of proster options are reduced due to downshifting. If risk is percieved then additional proster options are available as more of the input and feedback can be evaluated in the cerebrum cortex and leads to enhanced learning.

6. Proster Model Applications to Training

If learning is viewed as the acquistion of new programs and the increased networking of programs this process can be improved by controlling the training situation. An improvement in the learning environment can be

obtained by:

1. Increasing the amount of input the individual recieves so that patterns can be percieved in the information presented.

2. Allowing feedback through the practical application of information and interaction with the environment.

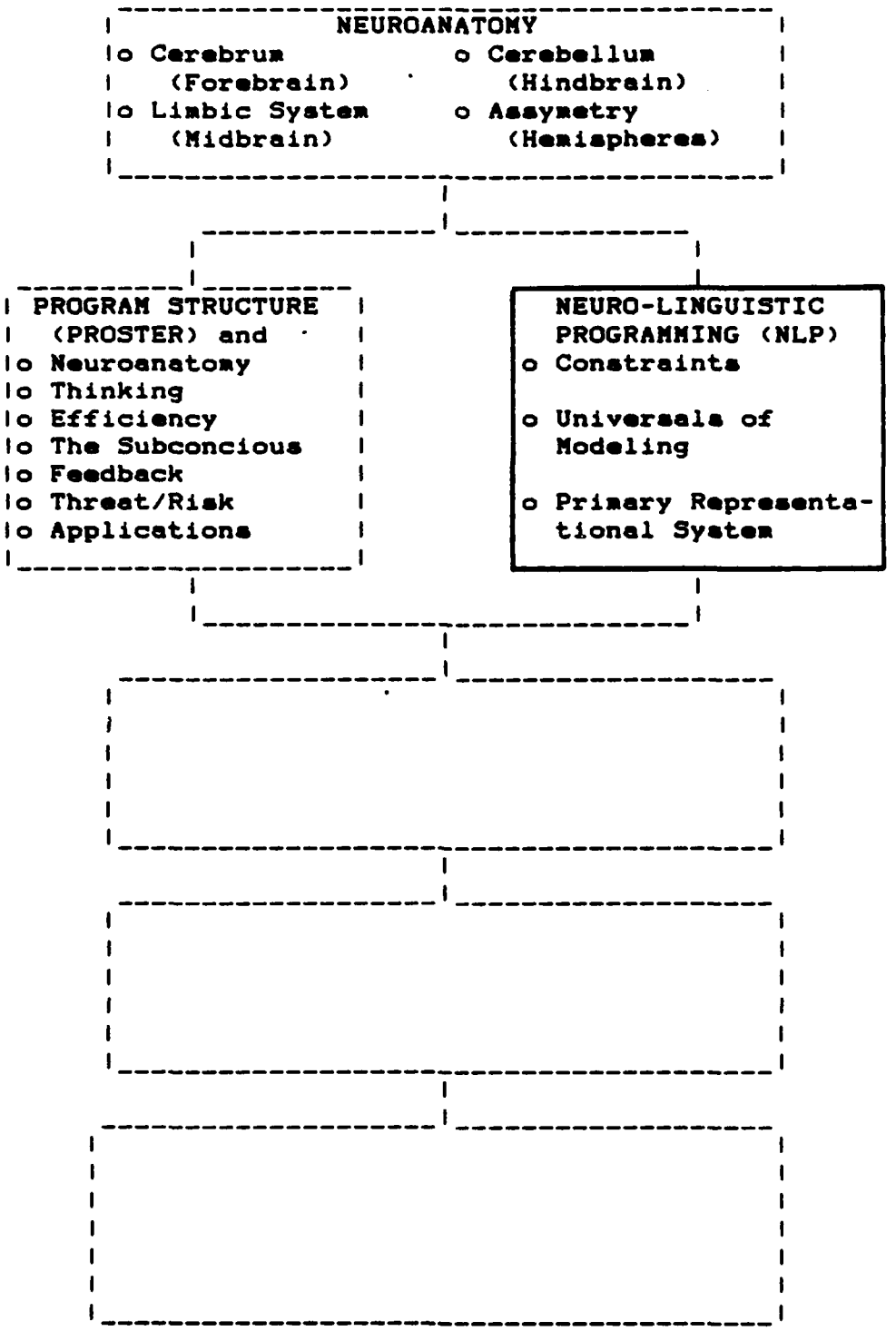
3. Insuring a threatening environment is avoided.

4. Insuring challenging and controlled risk situations are included in applying information presented to practical situations.

C. THE NEURO-LINGUISTIC PROGRAMMING (NLP) MODEL

The Neuro-Linguistic Programming Model has drawn from the fields of Cybernetics, Neurology, Cognitive Psychology, Hypnosis and Linguistics to develop a theory of how interpersonal interaction takes place. After studying the methods of therapists such as Virginia Satir, Milton Erikson and Fritz Perls, Richard Bandler and John Grinder, organized the NLP model to show that the seemingly intuitive decisions, made in a therapeutic setting, were based on an understanding of how each individuals perception of the world is formed. (Schaefer, Beusay & Pursley, 1983, p. 3) While the NLP model was developed for its psychotherapeutic value the basic concepts of the means by which information is percieved, translated, and stored in the brain carries implications which should not be ignored by trainers.

Basic to NLP is this understanding of how individuals categorize information and how they percieve, classify and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PROGRAM STRUCTURE (PROSTER) and
o Neuroanatomy
o Thinking
o Efficiency
o The Subconcious
o Feedback
o Threat/Risk
o Applications
NEURO-LINGUISTIC PROGRAMMING (NLP)
o Constraints
o Universals of Modeling
o Primary Representational System

Figure 8

internalize their map or model of the world. The individuals model of the "real world" is shaped by contraints and filters which affect the inputs to the model they have formed. The methods that different individuals use to store, organize, and accesa information for use, is important in theorizing how we can speed the effective delivery of material to a student.

1. Contrained Inputs

NLP recognizes that the five senses are used to input information about the world to the brain. Vision (sight), audition (hearing), and kinesthtics (feeling) are the predominate senses used used for information processing, while the olafactory (smell) and gustatorial (taste) senses play a smaller role. Each of the three primary sensory input channels provides a constant ongoing stream of information which is used to classify experience. (Bandler & Grinder, 1975, pp.4-5) NLP recognizes that these channels of input are restricted by three descriptive catagories of constraints. (Bandler & Grinder, 1975, p. 8)

a. Neurological Constraints

In considering the senses it is recognized that only a limited portion of the environments physical activity is within the range of human perception. While the physical environment contains many perceptable stimuli a great deal more actual activity takes place outside our ability to see, hear, or feel. The human eye cannot discriminate items which

are very small or that are at extreme distances. The human ear has less range than the auditory ability of many animals. Various portions of the body are more discriminating to touch than others by design. These limits to our ability to percieve all phenomenon places filters between the real world and the representation of the world which the individual is able to form. (Bandler & Grinder, 1975, pp. 8-9)

b. Social Constraints

The second set of constraints are social in nature. As members of a social system language, accepted ways of percieving, and accepted social fictions allow the individual to function as a member of a culture with a relatively consistant set of rules. (Bandler & Grinder, 1975, p. 12) These rules establish the context of perception and make the information easier to classify.

Many verbal and non-verbal communications filters go unnoticed until the structure of the communication is violated. These rules are normally out of the normal range of perception and act to speed communication as well as restrict it. As Hall states:

> one is completely unaware of the fact that there is a system of controls as long as the program is followed . . .this means that the majority of mankind is denied knowledge of important parts of the self. . . .(Hall, 1976, p. 44)

c. Individual Constraints

Each individual has a set of experiences which constitute a personal experience base. The ability to

understand and to catergorize inputs is a function of past experience. The individual abilities and self perception based on the experience will influence their perception of the world adding or subtracting from any new experience. The unique history of each individual will necessarily change and color the interpretation of any new experience. (Bandler & Grinder, 1975, p. 13)

2. The Universals of Human Modeling

Modeling the world allows survival, growth, change, and the experience of joy. These same processes block growth if the model created is mistaken for the real world. Each individual models the world by using three universal modeling mechanisms: generalization, deletion, and distortion. (Bandler & Grinder, 1975, p. 14)

a. Generalization

Generalization of elements of a model takes place when an original experience is used to represent an entire category of experience. This adaptive characteristic of the human condition can limit the ability of the individual to objectively evaluate experience. (Bandler & Grinder, 1975, pp. 14-15) This trait also allows for the use of information in unfamiliar situations which can expand the individual model of possible actions.

b. Deletion

Deletion is the process whereby the individual actively attends to one part of an experience while ignoring

other parts. In describing ways that individuals combat cognitive dissonance Festinger (1957, p. 156) states that one way is forget information. This trait allows for the filtering of input so that the capability of catergorizing input is possible. The loss of experience may be too great, in some instances, and severely restrict the available inputs to the representation of the world that is formed. (Bandler & Grinder, 1975, pp. 25-26)

c. Distortion

Distortion of experience to maintain the internal integrity of an established representation limits the ability to experience new phenomenon. This trait of human modeling allows the individual to shift the experience of sensory data to fit an existing model. (Bandler & Grinder, 1975, p.16)

Distortion of an experience may come about in order to avoid or reduce internal conflict. Unlike deletion, where information may be conveniely ignored, distortion allows the individual to actively change the internal representation of experience to comply with the needs of the existing model to avoid dissonance.

3. The Primary Representation System

All of the constraints and universal processes of modeling work together to influence the representation of the world each individual creates. After passing through these filters a translation of experience into a Primary Repesentational System (PRS) takes place.

The individual PRS may be predominately visual, auditory, or kinesthetic. The preference that each individual has in encoding information within the brain affects their method for the recall of stored material. Some individuals see the experience, or hear the words of an experience first. Others may access an experience based on the feeling that accompanied the experience.

> Our thinking deciding, remembering, and behavior can be described as a sequence of internal representation usually partly or entirely outside awareness) that has pattern as well as content, Like a program in a computer, this pattern limits the possible ways that any content can be processed and utilized. (Stevens, 1978, p. 85)

This type of categorized pattern that is transformed from a real experience in to an internalized one is termed the Deep Structure. This is where the individual represents experience by transforming them to the most highly valued representational system for future access and then to a natural language to represent the PRS. (Bandler & Grinder, 1975, p.28)

4. NLP Applications to Training

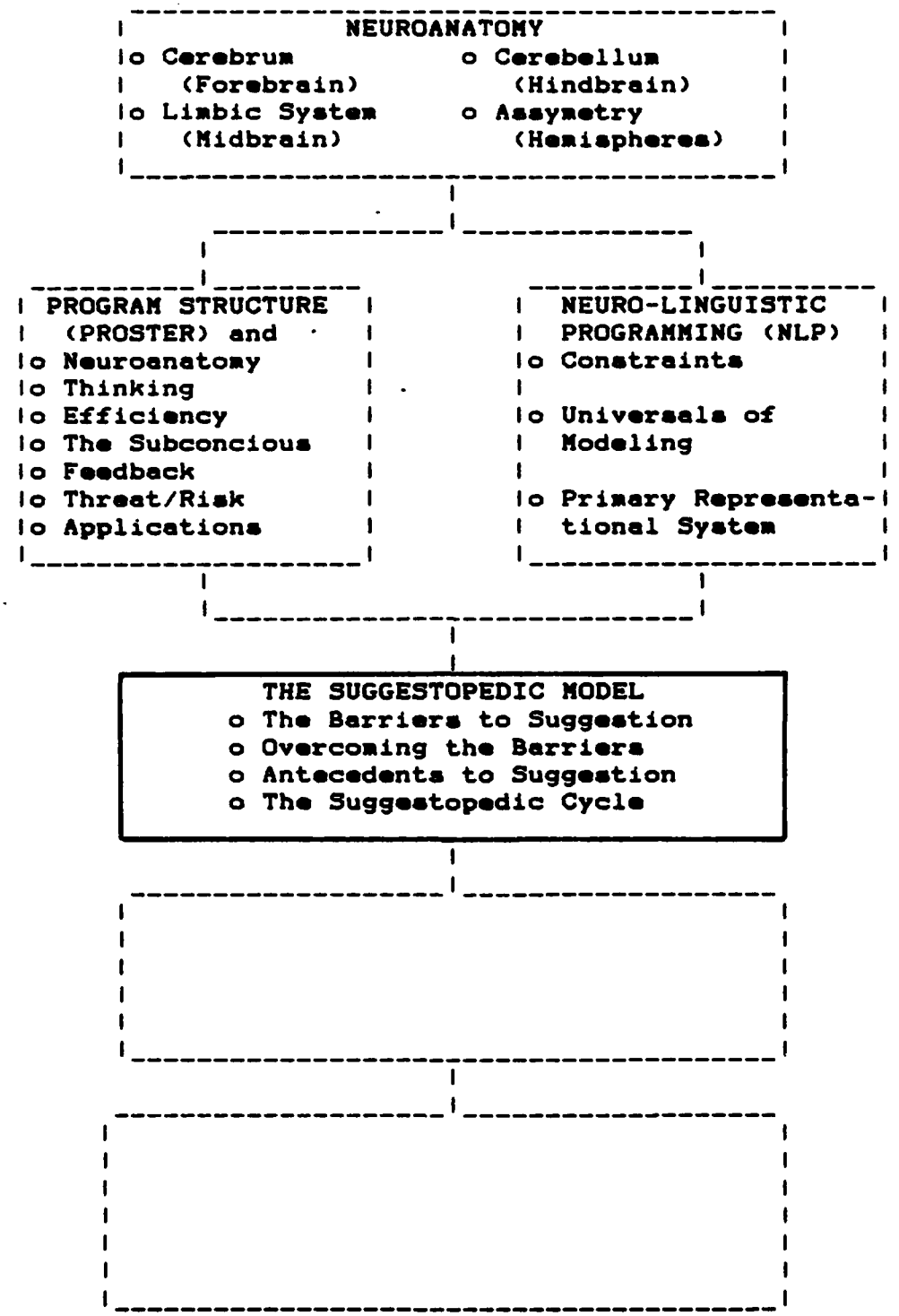
In any group of trainees it is likely that visual, auditory, and kinesthetic PRS types will be present. Input which is presented in the same representational system as individuals PRS will be stored for access more quickly and with less translation error than would occur if transformation to the individual's PRS were necessary. A regard for the individual modes of representing information should

lead to a balanced presentation of material using visual, auditory, and kinesthetic content and training aids.

D. THE SUGGESTOPEDIC MODEL

The Suggestopedic Model was devised by G. Lozanov, a physician, psychiatrist, psychotherapist, and educational researcher, who from 1955 through 1965, successfully developed his system of pedagogy to illicit hypernesia (heightened recall). He primarily used foreign language acquistion to measure the effects of his training methodology and was able to speed learning by a 3 to 1 ratio over other foreign language training methods. Following experiments showing the veracity of his method to the Bulgarian Ministry of Education the Institute of Suggestology, in Sofia, Bulgaria was established and funded to allow Lozanov to continue to perfect his system of instruction which he named Suggestopedia. (Lozanov, 1978, p. 13)

The motivation for developing this system of instruction was based upon the conviction that the ability of the individual to learn quickly and easily was far beyond the results that were being produced by more conventional teaching systems. A social-suggestive norm of limited human capabilities and of unpleasant learning which permeates the majority of teaching methods was hypothesized. This restrictive norm was the constraint which the methodolgy of Suggestopedia was designed to overcome by using a combination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THE SUGGESTOPEDIC MODEL
o The Barriers to Suggestion
o Overcoming the Barriers
o Antecedents to Suggestion
o The Suggestopedic Cycle

Figure 9

of desuggestion and positive suggestion. The social-suggestive norm of limited capabilities is desuggested, that is shown to be a fiction, and quick and easy learning is suggested in place of the restrictive norm. (Lozanov, 1978, p. 22)

It was estimated that "man uses only four percent of the brain's capacities. The other 96 percent are unactivated potentials" (Lozanov, 1978, p. 6). By using suggestion Lozanov was able to use this idle potential and accelerate learning by as much as three times over that of a "normal" classroom without loss in retention of the material covered and without ill effects on the students. (Caskey & Flake, 1976, p. 2)

1. The Barriers to Suggestion

In order to tap into the reserve potential of the individual through suggestion Lozanov contends that certain protective anti-suggestive barriers must be dealt with. to mental and physical health. They act as filters to the environment to protect the individual from being "easily accessible to any kind of suggestion" (Lozanov, 1978, p. 168). In order for the individuals reserve potential to be utilized in learning the negative influence of the barriers must be overcome. This is accomplished by insuring that the information to be learned, and the manner in which it is presented complies with the requirements of these These barriers to suggestion are recognized as necessary to

barriers. As Lozanov states: "the overcoming of barriers signifies harmonization with the barriers" (Lozanov, 1978, p. 165).

a. The Critical Logical Barrier

This barrier "rejects everything which does not give an impression of well-intended logical motivation" (Lozanov, 1978, p. 164). Any suggestion which would be in conflict with a logical conclusion would invoke this barrier. For example an individual told that learning is easy and fun might find this to be in conflict with their past performance in a school setting and think the person giving the suggestion to be attempting to decieve them.

The instructor must be cognizant of the fact that any unqualified statement such as the one presented above may have a negative impact. Instead the suggestion might be presented by having the student visualize a learning experience in which they did learn easily and quickly and suggest that this same type of learning is possible in a classroom environment.

b. The Intuitive-Affective Barrier

This barrier "rejects everything which fails to create confidence and a feeling of security" (Lozanov, 1978, p. 164). Any perception of threat will invoke this barrier. Feelings of a relaxed atmosphere and a concerned open helping relationship between the instructor, the individual, and

other students must be maintained to insure this barrier does not prevent the rapid acquisition of information.

c. The Ethical Barrier

Any "suggestions contradictory to the ethical principles of the individual" are rejected (Lozanov, 1978, p. 164). This barrier protects the individuals self-perception by insuring that any suggestions that run counter to the sense of right and wrong are not accepted as true. Of the three barriers this one is the least likely to be encountered when dealing with the "factual" subjects of a training regimen.

2. Overcoming the Barriers to Suggestion

The barriers to the successful use of suggestion may be overcome by using a desuggestive-suggestive process. As Lozanov states:

> suggestopedic hypernesia is accomplished not so much by the suggestion of increased capacities but from the desuggestion, from the historically and individually built up suggestion of the limited capacities of memory. (Lozanov, 1978, p. 165-166)

The means Lozanov used to accomplish this desuggestion-suggestion are through the use of a number of Suggestive Factors and the orchestrated Suggestopedic Cycle.

a. The Suggestive Factors

(1) Authority. This factor relies upon the "non-directive prestige which by indirect ways creates an atmosphere of confidence and intuitive desire to follow the set example" (Lozanov, 1978, p. 187). The the instructor and

the institution must present a positive impression of ability and professionalism so that a trust by the student is engendered. This is not an authoritative attitude of power rather it is trust related to the students belief that the instructor can be trusted to provide correct information.

(2) Infantilization. This factor is closely tied to that of authority. "A feeling of peace receptivity is created--the same as that created in the pleasant atmosphere of a children's group" (Lozanov, 1978, p. 192). The same trust engendered by the prestige of the instructor is used, as well as, role playing and a relaxed non-judgemental atmosphere. The attitude of play in learning was also recognized by John Dewey as a significant tool of learning.

> So when children play. . .a world of meanings, a store of concepts (so fundamental in all intellectual achievement), is defined and built up. . .Playfulness is a more important consideration than play. The former is an attitude of mind; the later a passing outward manisfestation of this attitude. (Dewey, 1933, p. 209)

(3) Double-planeness. This factor describes the information that is recieved from the non-verbal and peripheral environment during a communication. Congruancy between the verbal and the non-verbal message sent is of utmost importance. A message that is subconsciously evaluated as non-congruant will not have a suggestive impact. Lozanov states that: "it must be emphasized that no suggestive work should start without a mastery of the double-planeness of behavior" (Lozanov, 1978, p. 194).

(4) Intonation. This factor refers to the dramatic presentation of material during the concert phase of the Suggestopedic Cycle. The reading of the material to be assimulated in harmony with the music.

> Moderately artistic intonation increases the information value of the material given, engages the emotional and double-plane aspects of the communicative process more actively, and creates an atmosphere of acceptable significance. (Lozanov, 1978, p. 195)

(5) Rhythm. While not specific in the application of the concept of rhythm Lozanov places importance upon it as a "basic biological principle, a reflection of the rhythms in nature" (Lozanov, 1978, p. 196). In the early experimentation of this method a rhythmic breathing pattern was practiced. More recently the use of this breathing pattern and rhythmic intonation, a horizontal swing of load, normal and softly spoken presentation of material during the concert phase of the Suggestopedic Cycle has been dropped. The artistic intonation, as described above, has been retained. The dramatic and artistic qualities of intonation in time with music while reading material is felt to be necessary to maintain the suggestive set-up of the classroom. (Schmid, 1978, p. 184)

(6) Concert Pseudopassiveness. "Behavioral passiveness of attention with considerable internal activity is characteristic of the suggestive setup" (Lozanov, 1978, p. 60). While appearing to be completely relaxed and listening to the selected music the mind is actually

processing the information being read over the music on a subconcious level. This passiveness is said to facilitate hypernesia and liberate the intellectual activity to operate without any disturbing strain. The idea that one must try to memorize is foreign to Suggestopedia and is the attribute of the method which allows hypernesia without the physical or psychological fatigue. Special training to achieve this psuedopassive state is not necessary,

> only the set-up of a serene, confident attitude toward the suggestive program being presented, and to be in the same state of mind as one would be in attending a concert. (Lozanov, 1978, p. 198)

Through the set-up and addition of the concert state of psuedo-passivenenss "the anti-suggestive barriers are much more easily overcome and the reserve capacities of the mind are released." (Lozanov, 1978, p. 198)

Music from the classical Romantic and Baroque eras is used to relax the student and attain the state of psuedo-passiveness. It is Lozanov's contention that the use of music enlists the entire brain in learning, involving the left and right hemispheres as well as the cortical and subcortical structure of the brain. (Beer, 1978, p. 22)

b. <u>The Suggestopedic Antecedents</u>

In order to insure the proper set-up, which is necessary to accomplish hypernesia, a number of mediators to the set-up of a positive suggestive atmosphere must be attended to. The conscious and subconscious mediators are

required to be in harmony inorder to maximize the suggestive effect.

(1) Attitude. A readiness to participate in the suggestive learning experience.

(2) Motivation. The desire to participate in the experience and to achieve a goal.

(3) Expectancy. The belief that the results promised can be attained an excitement to try the method.

(4) Interest. The congruancy of the training with the individuals search for self-actualization.
If the suggestive factors of authority, infantilization, double-planeness, intonation, rhythm, and concert pseudopassiveness are used as designed the mediators of the personality set-up will bring the desired harmony about. (Lozanov, 1978, p. 126)

c. The Suggestopedic Cycle

The Suggestopedic Cycle as described by Schmid (1985, pp. 7-8) are outlined below to give the reader a feel for the orchestration of the Suggestopedic methods elements in the classroom setting.

(1) Prelude (or Decoding). This session is used for review of the previous days material and a brief explanation of the most important elements of the first lesson presented for the days lesson. Appropiate use of a wide range of communication elements is appropiate. Voice

intonation, acting-out, drawing, and body language should be used. Occasional involvement of the students to keep their attention and to give them a feeling of involvement.

(2) Concert One. Students have now recieved the text or next chapter and follow as the instructor reads over music, following the volume and cadences of the music. Classical music of the Romantic period (see Appendix A) is used. There is special emphasis on the pronunciation. Concert One is used most effectively for teaching foreign languages and new and unusual vocabulary.

(3) Concert Two. Students are now invited to close their eyes, sit straight in their chairs, relax, and listen to the same text read again by the teacher, but now according to the content of the words. The instructor reads as if trying out for a part in a play. Since the students have their eyes closed, the instructor has only voice control to keep attention of the students. The music here is only a background, a relaxant. Only the slow movements from Baroque compositions (Appendix A) are used (usually the middle movements) because they produce the desired effect. The music should only have a beat of between 55 and 70 per minute but should also have a perceptible rhythm. Studies have shown that the pulse and heartbeat automatically synchronize with the beat of the music thus relaxing the students. At the end of the second concert reading, students are advised to remain silent, not speak, for about 8 minutes to allow the

information to find a comfortable place in the long-term memory bank. The class usually ends with Concert Two.

(4) Activation (or Elaboration). The following day or class: the new information is now brought to the active level, that is, the student are now using the material in conversations, games, skits, problem-solving, imaging exercises, and practical applications. About 70 percent of the the time is spent activating the material.

d. The Suggestopedic Classroom

Just as non-verbal messages are sent by the teacher the classroom arrangement and decor can have positive or negative affect upon the student. Special care is taken to make the classroom comfortable and pleasant. In Lozanov's experiments the students were provided with comfortable overstuffed chairs, much like those that would be seen in an American living room, which were arranged in a semi-circle. The classrooms were decorated with pictures and the lighting was soft and unobtrusive. The language classes were typically limited to twelve people. (MaCoy, 1977, p. 6)

The elementary school experiments were conducted in the normal classroom setting with excellent results. The use of peripheral stimulus in these experiments consisted of prepared pictures and posters which contained information which the students would be taught one or two days hence. No attention was drawn to these decorations in any conscious way. It was found that the information had been transmitted

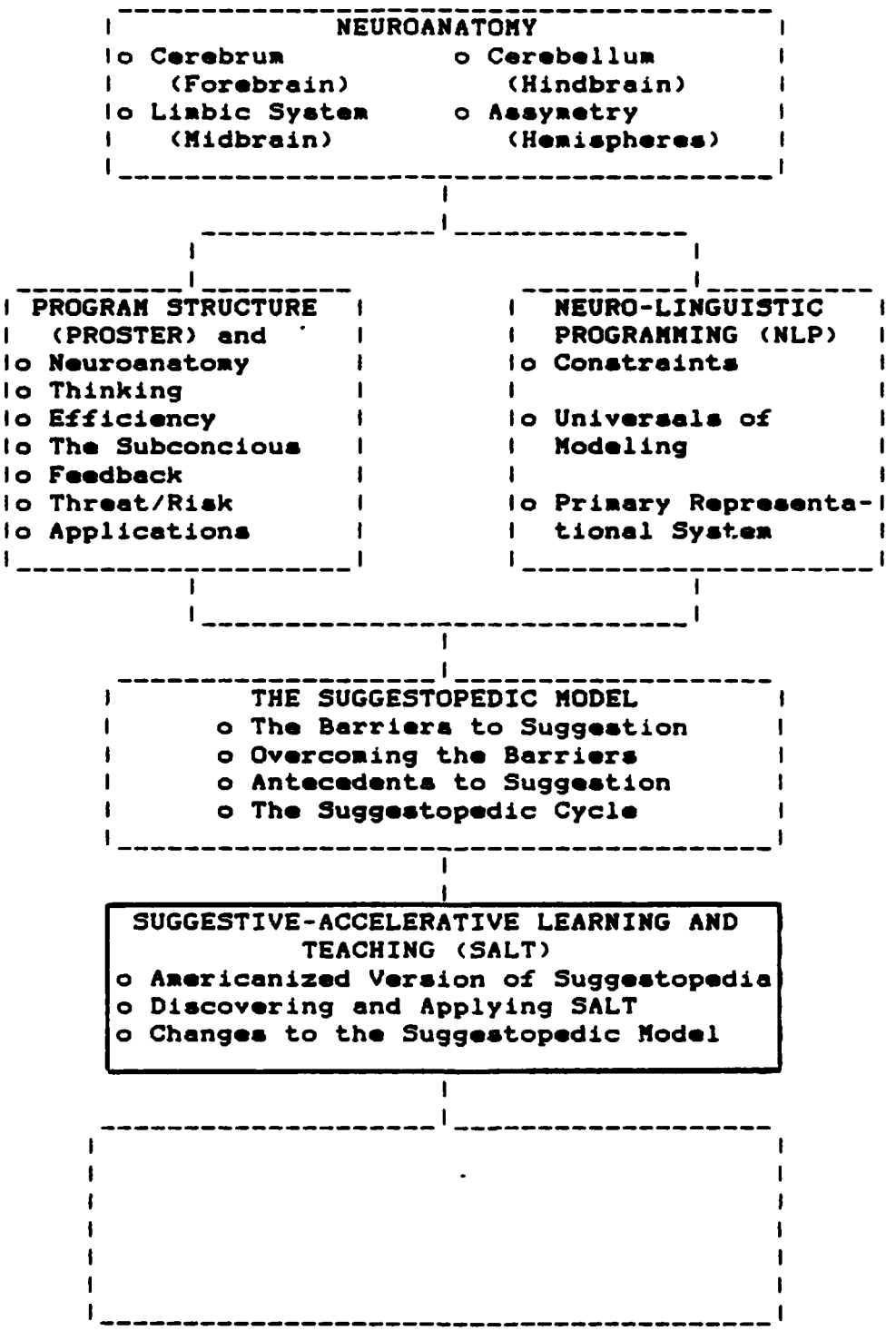
to the students on an subconscious level and that this acted as their first introduction to new material. Experiments conducted by Lozanov

> have shown that considerably high percentages of peripheral perceptions are apprehended, without loss of energy, and that they extend the scope of the assimilated and automated material in long-term memory. (Lozanov, 1978, p. 261)

Just as the subconcious mind can be influenced by the non-verbal communications of an instructor, the atmosphere of a comfortable pleasant classroom, and music has an effect. The mind does note and store information on a subliminal level. This subconcious perception is used to increase the speed and depth of learning and is included as part of the suggestive atmosphere of the Suggestopedic classroom.

E. SUGGESTIVE ACCELERATIVE LEARNING AND TEACHING (SALT): THE USE OF SUGGESTION IN THE AMERICAN CLASSROOM

Information concerning the Suggestopedic methodology and its ability to accelerate learning was often incomplete and slow to reach the educational researchers in the United States in the late 1960's and early 1970's. Information did began to filter into this country through Soviet and Eastern bloc literature, however. The reports of Lozanov's dicoveries of attaining hypernesia in the classroom became much more widespread after the popular book Physic Discoveries Behind the Iron Curtain (Ostrander & Schroeder, 1970) was published. These reports of accelerated learning provided no substantive theoretical detail of the method.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SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING (SALT)
o Americanized Version of Suggestopedia
o Discovering and Applying SALT
o Changes to the Suggestopedic Model

Figure 10

1. Discovering and Applying SALT

The first experiments using suggestive-based instruction, in this country, were accomplished in 1971 by two researchers from the University of Iowa and Iowa State University in an attempt to replicate Lozanov's experiments (Benitez-Bordon & Schuster, 1976). These pilot studies, using Spanish language teaching, were successful in convincing the researchers that the method did have possibilities. This same year beginning Russian was taught to undergraduates at Cleveland State University in half the time it took for the control group (Kurkov, 1977). Considering the fact that the experimentors had to piece together the Suggestopedic method from a number of sources the ability to replicate the acceleration of learning at this stage was encouraging.

In 1972 the Canadian and Bulgarian governments signed an agreement which allowed a team of Canadian Public Service Commission employees to be trained in the method. The team returned to Canada after being given the opportunity to teach at the Research Institute of Suggestology, Sofia, Bulgaria and began experiments teaching conversational French to public service trainees in 1973. These experiments were conducted to ensure that the methodology did not "rest on cultural factors peculiar to Bulgaria" (Racle, 1975, p. 41). The method proved to be effective and more information was made available to experimentors in this country.

Another Canadian educator, Dr. J. Bancroft, made several visits to the Sofia Institute from 1971 through 1974 and was able report much more throughly the principles and practices on which the methodology was developed. Particular questions related to rhythmic breathing, which has been dropped from the methodology since this time (Bancroft, 1978, p. 156) and the specific questions concerning the music used in the concert sessions were answered.

As more was being learned about the method American researchers were manipulating the variables of the system and applying the method to subjects other than foreign language instruction. Applications of suggestive-based instruction were made in public schools and were found to have a significant effect on learning.

The methods used in these applications of suggestion to the American classroom included the use of physical relaxation and exercise, restimulation of a early pleasant learning experience at the beginning of class sessions, and the use of concert two only, rather than both concert sessions in many cases. The existing classroom furniture was used rather than the easy chairs that have been a trademark of the Lozanov experimental classroom. The increasing use of the method and the fact that a number of studies were being conducted throughout the United States led to the formation of the Society of Suggestive-Accelerative Learning and

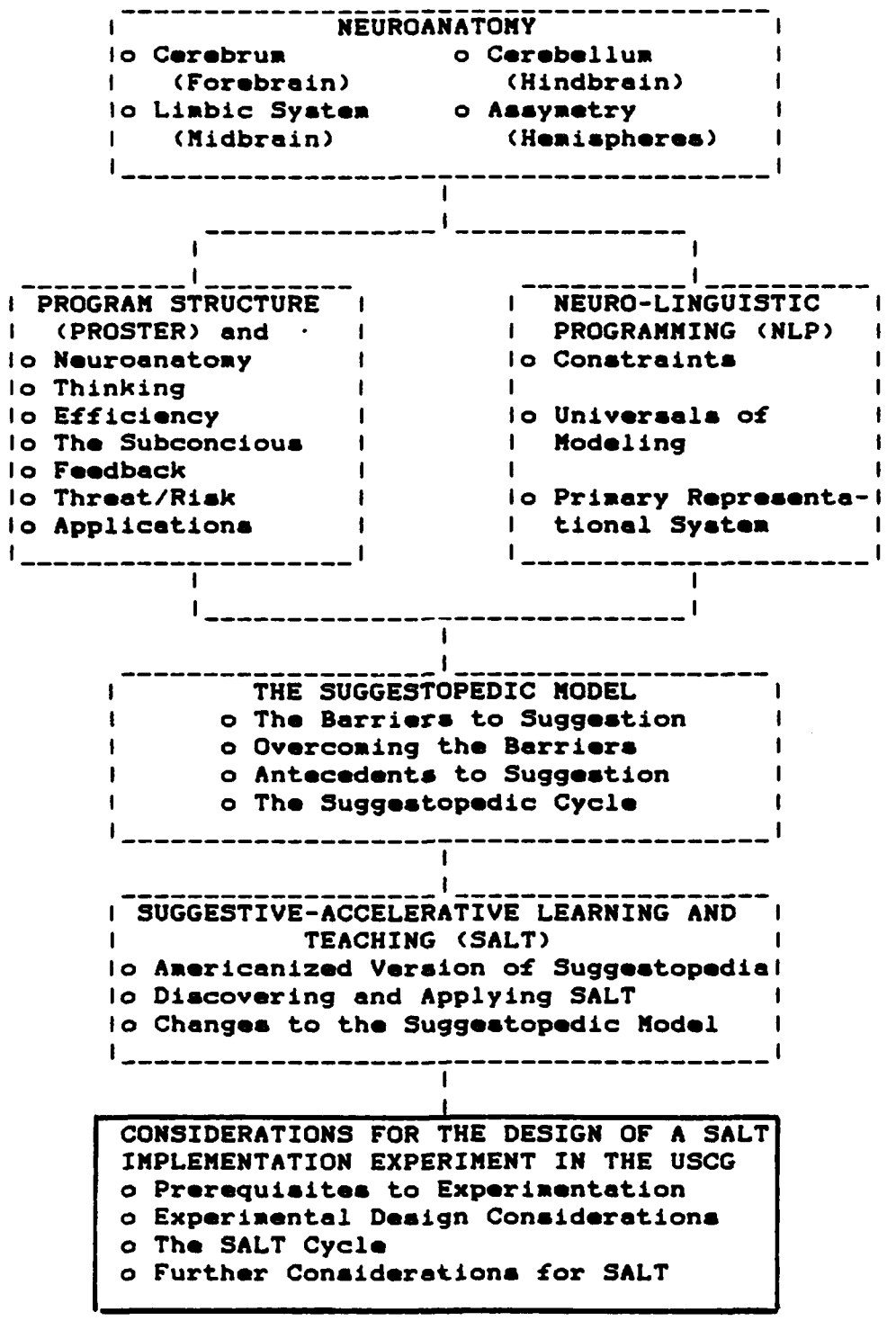
Teaching. It was at this juncture that the use of the acronym SALT for the Americanized version of Suggestopedia was begun.

The SALT methodology was successfully used in such diverse settings as the teaching of eighth grade science in a public junior high school (Gritton & Benitez-Bordon, 1976), Naval ROTC naval science at the university level in half the ususal number of classes (Peterson, 1977), elementary school remedial reading showing a 4:1 gain in learning (Prichard & Taylor, 1976), vocational agriculture in junior high with a 2:1 acceleration in learning (Walters, 1976), ninth grade earth sciences with increased learning over the control group (Schuster & Ginn, 1978), college level statistics to mathophobic students (Capehart, 1976), reading to fifth grade students with significant improvement shown over the control group (Prichard, Schuster, & Genach, 1980) and the teaching of Pascal computer language, with an acceleration of 2:1 over the control group, to large audiences (n=123 & n=106) at the university level (Schuster, 1985).

In 1976 a two year experiment was begun in Central Iowa Public Schools (Schuster & Prichard, 1978) using first through ninth grades, on the effectiveness of SALT. Measures of improvement in achievement, affective relations, school stress, learning orientation and creativity were made. The experiment showed mixed results particularly in the first year with only four of sixteen experimental sections out

performing the control sections. One instructor managed a 2.5:1 acceleration of learning over the control classes and three classes showed negative results. The second year of the study found seven of ten experimental groups exhibiting significant positive results over the achievement of the control groups. Creativity, in the use of learned material, was found to be significantly improved for the students of the experimental groups. (Edwards, 1978)

The wide applications of the SALT methodology to subjects other than lanuage instruction have resulted in positive outcomes in the majority of studies. The practical modification of the methods to limited class periods in the public school environment with various age groups does not seem to have a significant detrimental effect on the usefulness of the method.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o The Subconcious
o Feedback
o Threat/Risk
o Applications
NEURO-LINGUISTIC PROGRAMMING (NLP)
o Constraints
o Universals of Modeling
o Primary Representational System
THE SUGGESTOPEDIC MODEL
o The Barriers to Suggestion
o Overcoming the Barriers
o Antecedents to Suggestion
o The Suggestopedic Cycle
SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING (SALT)
o Americanized Version of Suggestopedia
o Discovering and Applying SALT
o Changes to the Suggestopedic Model
CONSIDERATIONS FOR THE DESIGN OF A SALT IMPLEMENTATION EXPERIMENT IN THE USCG
o Prerequisites to Experimentation
o Experimental Design Considerations
o The SALT Cycle
o Further Considerations for SALT

Figure 11

III. THE APPLICATION OF SUGGESTIVE ACCELERATIVE LEARNING AND TEACHING TO THE COAST GUARD TRAINING ENVIRONMENT

In the course of conducting research for the application of Suggestive Accelerative Learning and Teaching the Coast Guard Training Center located at Petuluma, Ca. was visited to for the purpose of selecting a training cirriculum which could be used to conduct an experiment using the SALT methodology. After discussing the attributes of SALT with the the Training Center Training Officer and Assistant Training Officer the Morse Code training at Radioman "A" school and the Emergency Medical Technician (EMT) school curricula were chosen for investigation. The goal of this research was to ascertain which curriculum would provide the best research vehicle for future experimentation using SALT.

Both curricla were examined and in session classes were attended to develop an understanding of current training methodologies. After evaluation of the methods of instruction and the materials provided it was felt that the EMT school had a number of attributes which made it the best choice for initial application of SALT in the Coast Guard. The reasons for the choice of the EMT course are:

1. The school is currently in an accelerated mode of instruction. The amount of training that Coast Guard personnel recieve in 14 working days is normally spread over a semester of instruction at colleges. Any acceleration in this intensive and successful curriculum (100 percent graduation of the last 4 classes) would provide an excellent example of what is possible using this methodology.

2. The major complaints of the students after attending the course were that they had insufficient time to prepare lessons and that they experienced too much fatigue caused by the intense nature of the instruction. Suggestive-based instruction has shown an ability to accelerate learning without causing fatigue.

3. The academic and practical nature of the material which comprises the objectives of the course (see Appendix E) make it well suited for the activation of material presented in the lecture environment.

4. Class size (maximum of 36) and the rates and ranks which are typically represented by the classes give a good cross section of Coast Guard personnel to evaluate the effectiveness of the methodology.

5. The importance of retention of the material makes the attributes of increased long term memory using SALT methodology potentially beneficial.

6. The relatively small staff of instructors, from various rates and ranks, will make a useful cross sectional measure of the effectiveness of SALT training for the expanded use of the method in other curricula.

7. The likelihood of having additional time for the practical application of the training at hospital emergency rooms and with ambulance services could prove beneficial if course acceleration was accomplished effectively.

A. RECOMMENDED DESIGN FOR A SALT IMPLEMENTATION EXPERIMENT

The implementation of SALT in an experimental mode, to the EMT cirriculum should be designed to test the following null hypotheses:

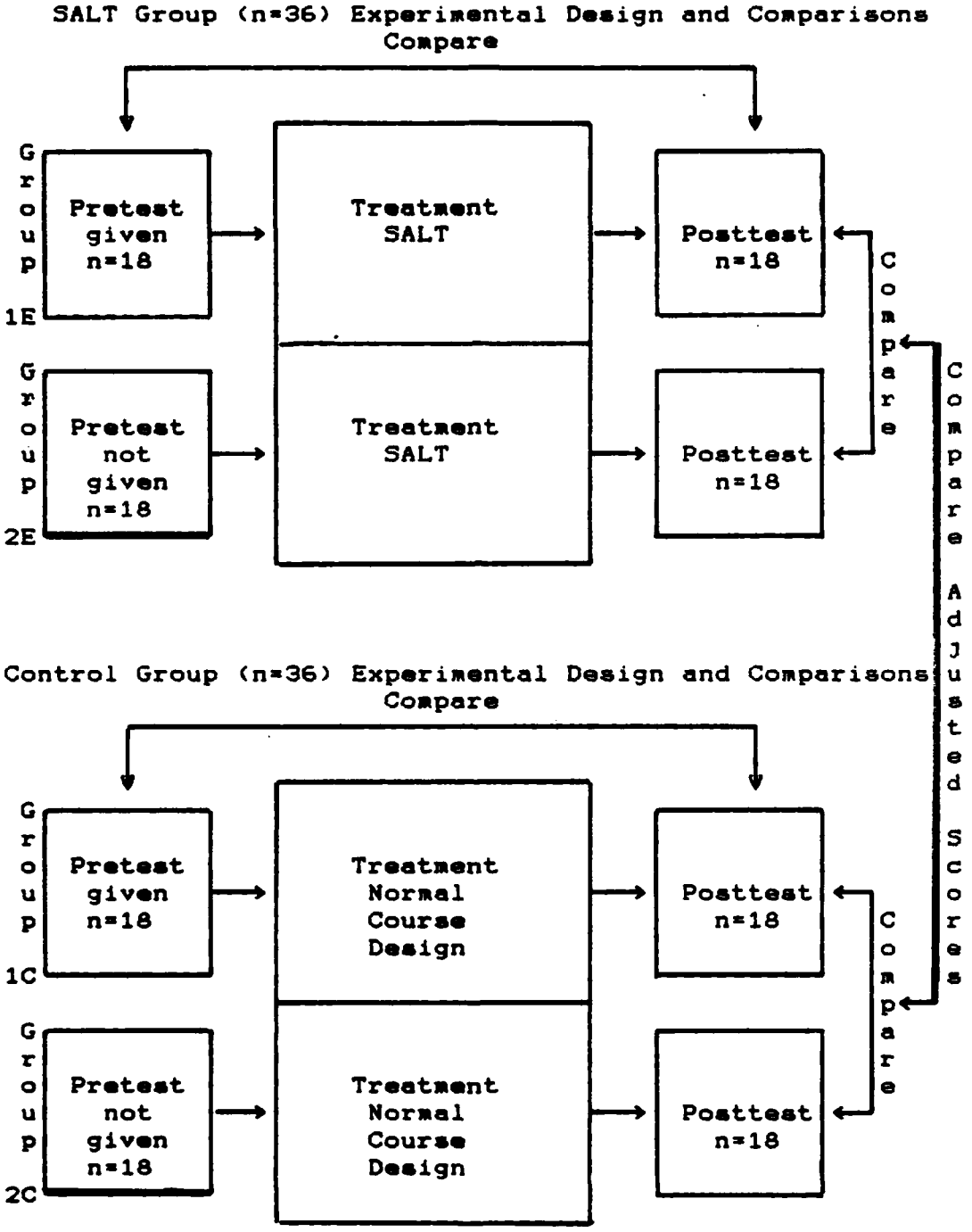
1. The use of SALT has no effect on the amount of material learned as measured by the final written examination.

2. The use of SALT has no effect on reducing percieved school stress.

An independent group experimental design (n=72) with a pre-post test comparison within the groups could be used to

test the hypotheses (see Figure 12). The control group used for comparison would be a class taught in the normal manner with the only change being the addition of the pre-post tests. The first pretest would be for prior medical knowledge. This test would be used to control for non-treatment knowledge acquistion and should be as close to the final written examination as possible in content and format. The second pre-post test would be the Brooks Student Questionnaire (BSQ) as refined by Schuster and Millard (1978). This test would be used to measure percieved school stress, student-teacher affective relations, and school-learning orientation change. (Schuster & Prichard, 1978, p. 112) Each pretest would be administered to half of the students of the experimental (n=18) and control (n=18) groups. For pretest purposes each class could be divided to allow half of the students to take the written exam and half to take the refined BSQ.

A comparison of the difference in the means of the pretest and posttest results of group 1 minus the difference between the posttests for group 1 and 2, for both the experimental and control groups, provides an estimate of the effect caused by the treatment. (Drew, 1980, pp. 105 & 154) The comparison of the adjusted results between the experimental group and the control group provides the measure of effectiveness of SALT versus the normal course design with control for effects of pretest administration.



Recommended Experimental Design for Test of Effectiveness of SALT Application (Drew, 1980, pp. 105 & 154)

Figure 12

1. Prerequisites to Experimentation

Training of EMT school instructors in SALT methodologies can be accomplished on a contract basis. The necessity of having adequate training of instructors cannot be overemphasized. It is recommended that the Society of Suggestive-Accelerative Learning and Teaching, 2740 Richmond Avenue, Des Moines, Iowa 50317, be contacted to obtain a current listing of qualified instructor training activities. A minimum of two quailified instructors is recommended to accomplish the experimental application of SALT in EMT school. This will allow for contingencies such as illness and will provide a lower student teacher ratio for the activation phase by using both instructors as supervisors. Following the formal training of instructors approximately one month will be necessary to prepare the necessary classroom materials for the implementation of SALT.

In addition to training of instructors EMT school will have to make available a quality cassette sound system to support the concert phases of the SALT cycle. The amount and condition of other training equipment, available at EMT school, is adequate to support the activation of lecture delivered information.

The current classroom size and decor is suitable for SALT training purposes. Additional posters, lists, and equipment can be added to the classroom on a rotational basis to allow full use of the peripheral perception of the students.

The atmosphere of quiet concentration during the lecture phase must be maintained. Interruptions caused by personnel entering the classroom or from noise outside the classroom must not be allowed to distract the students during the classroom lecture sessions.

The rearrangement of furniture in the classroom by moving desks along the walls and having the chairs placed in a semicirle for class presentation will be necessary. The intructor should lecture and demonstrate the material on the same level as the students and not lecture from elevated stage area as is the current practice. The desks can be used as a writting surface for section tests and quizzes without acting as a barrier between the students and the instructor.

2. Curriculum Design Considerations

The current structure of the EMT School curriculum consists of twenty eight terminal skill and knowledge objectives (see Appendix B). Each day anywhere from two to four units are taught, practical exercises are held and a section test or quiz is given (see Appendix C). Adjustment of the curriculum schedule could be accomplished to include approximately double the amount of lecture material presented in each class lecture meeting (see Appendix F). This would reduce total course time by approximately nineteen hours (see Appendix E). This time could be used for additional practical experience at hospital emergency rooms or the course could simply be shortened by two days. The practical

exercises, examinations/quizzes, and films could be used to activate the learned material with little change to the present practices of EMT school.

3. The SALT Cycle for Presentation of Material

Each class in which material is to be presented for the student's acquistion should begin with a relaxation and pleasant learning experience recall exercise similar to those presented in Appendix G. This practice has proven to be effective in generating a positive suggestive set-up as outlined in our review of SALT methodolgy in the previous chapter. Following this exercise a self corrected quiz, covering the previous day's subjects is given for review purposes. New material is then presented as outlined in the prelude/decoding stage of the Suggestopedic Cycle previously presented.

Following this stage of the cycle the active concert, or concert one presentation of material is begun over background music from the Classical and Romantic periods. The first selection listed for each numbered group of Appendix A provides examples of compositions from this period. Schmid (1985, p. 9) suggests the following selections as being particularly effective:

1. Beethoven's: (a) Piano Concerto No. 5 (Emperor); (b) Violin Concerto
2. Mozart's: (a) Violin Concertos No. 18 and 17; (b) Symphony No. 35 (Haffner); (c) Symphony No. 38 (Prague)

3. Haydn's: (a) Symphonies No. 67, 96, 102, 6, 7, 8

4. Tchaikowsky's: (a) Piano Concerto No. 1

As described in our discussion of the Suggestopedic Cycle information is presented while the student reads along on a prepared handout. The instructor should emphasize the pronuciation of words which are new to the student. "This type of concert reading has. . .been used in medical schools to familiarize students with unusual vocabulary, the names of muscles for example" (Schmid, 1985, p. 9).

Following the active presentation of concert one the student is asked to close his of her eyes and to relax. The material is then narrated over a Barogue musical background with the instructor using the inflection of his or her voice to keep the students attention. This passive concert, or concert two is useful for the acquisition of definitions or for the memorization of lists and procedures. Upon completion of this concert the students should remain silent and relaxed for approximately "eight minutes to allow the information to find a comfortable place in the long-term memory bank" (Schmid, 1985, p. 8).

Activation of the acquired information through the practical application of the material in the afternoon labs rounds out the SALT Cycle. The films and quizzes will also help the student to use and the material in a feedback situation that build upon generalized applications for the

THE SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING CYCLE

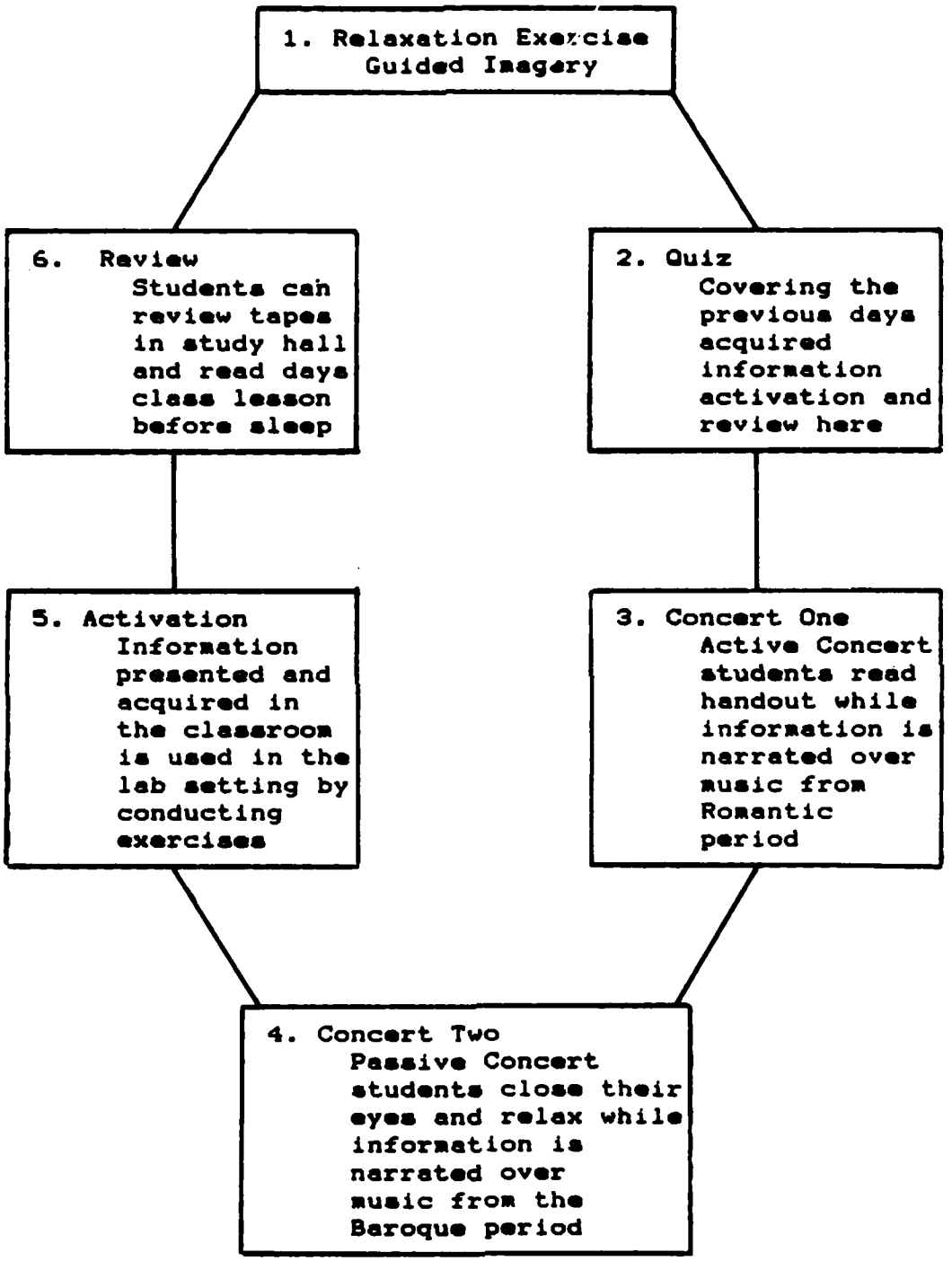


Figure 13

information which is acquired and adds depth to the material presented in class.

Concert two tapes of the classroom lectures can also be prepared for the students to review the material presented in the Study Hall each evening. The students should also be instructed to read over the handouts just prior to going to sleep in the evening.

4. Further Considerations When Applying SALT

The proposed class schedule presented in Appendix G leaves one hour available for the concert phases just prior to the break for the noon meal. This may prove to be excessive after the students and instructors become familiar and comfortable with the process. If this is the case the additional time could be used to activate the previous day's material at the beginning of each class.

The time savings hoped for in EMT school is not as great as the savings that might be anticipated in a more lecture intensive course, such as Radioman school. The use of EMT school has many other advantages which have been outlined previously. If the use of SALT proves beneficial application to other curricula would certainly be indicated.

IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. SUMMARY

The neurological findings of the last two decades have helped to shed light on how the human brain functions in learning. Two models which have categorized this information and allow it to be applied in the education and training environment were presented.

The first of these models, the Program Structure (Proster) model theorized that the brain is a complicated and highly efficient pattern distinguishing organ which can operate most effectively in a threat free, input rich environment. Verbal and non-verbal messages are recieved at the conscious and subconscious level for processing. Messages that are congruant allow the brain to function faster without dysfunctional conflict taking place at the cortical and subcortical levels.

The second model which relies on these neurological findings was that of Neuro-Linguistic Programming (NLP). This model developed the theory of constraints which affect the model of the world each individual forms from input to the brain. The input we recieve is transformed into a Primary Representational System (PRS) from which we access stored information and form new models based on additional input. Information is stored in the PRS in one of three

modes either, visually, auditorily, or kinesthetically. If information is supplied in a manner which is congruant to the individual PRS less deletion, distortion, or generalization is likely to occur. This allows the individual model to be a better representation of the real world.

The suggestive-based theories of Suggestopedia and its Americanized version, Suggestive-Accelerative Learning and Teaching (SALT), were reviewed. The practical application of the concepts gained from the review of the Proster and NLP models was shown. In addition the concept of desuggesting of the socially and individually learned limited potential for the acquistion of knowledge was introduced. The tools of suggestion and classroom management to overcome this limiting belief system were presented.

The application of SALT in the American classroom was reviewed and the experimental evidence of the models effects on accelerating learning in this country were presented. The experimental record shows that SALT can speed learning without detracting from the amount of material retained by the individual and without having a negative effect on the health of the student, caused by overload induced fatigue. The Suggestopedic classroon cycle was outlined and the changes and additions made by the SALT model were identified.

An implementation guide for the experimental use of SALT in the Coast Guard training environment was proposed. A recommendation for the use of the Emergency Medical

Technician (EMT) course taught at Training Center Petaluma, Ca. was made. An experimental design was proposed and measurement instruments were recommended to test the htpotheses of interest. Necessary changes to the classroom decor, atmosphere, and set-up were identified. A revised course schedule was presented which effectively doubled the amount of classroom lecture material presented each day. The proposed SALT cycle was outlined and described. Considerations for the training of SALT instructors were presented.

B. CONCLUSION

We have seen evidence from the experimental use of the suggestive-based methodologies that the individuals potential to learn quickly and easily is greater than is normally realized. Acceleration of learning by a 2:1 margin has not been unusual in applying SALT in the American classroom.

Culturally imposed norms and standards, which tend to limit learning potential and to condition the individual to the believe that learning is difficult tiring work, must be overcome. This social norm is proved true to the individual when brain incompatible teaching methods are used. The natural abilities of the brain are ignored in most American classrooms providing a "universal" proof to the belief of limited learning capabilities. The learns that school is a laborious task that must be endured.

Inorder to overcome these learned constraints of limited potential quickly, suggestion is used. First limited potential is desuggested and then through brain compatible instruction and positive suggestive techniques outlined in the SALT cycle the individual is freed to learn more easily and quickly.

Typically it takes many years of hard work on the part of teaching establishments to convince the individual that they must suffer to learn. The suggestive-based methodologies hold the promise of reversing this dysfunctional training quickly allowing the student tc tap into his unused learning potential .

The following points are presented in light of the findings presented in this work:

1. The study of neuroanatomy and brain function can adequately explain the reported acceleration of learning using the suggestive-based techniques.

2. The Proster and NLP models of the brain processes that take place in input, storage, and recall of information, indicate that the acceleration of classroom pace in a nonthreatening and relaxed enviroment is brain compatible and should enhance learning.

3. Lozanov's Suggestopedia and its American version, SALT, apply neurologically based findings to the classroom in an expeditious manner. By desuggesting the norm of limited learning potential and replacing it with a belief that one can learn quickly and easily acceleration of learning is plausible.

4. The SALT methodlogy can be adapted to the Coast Guard EMT school with a minimum of changes to the existing training curriculum and class schedule.

5. Instructor training and supervised practice using suggestion-based methods is necessary prior to experimentation using the SALT paradigm in the Coast Guard training environment.

6. Present resources at EMT school are adequate for the activation phase of the SALT cycle. The only addition to the schools plant property necessary to conduct experimentation will be a quality sound system for the concert phase of the cycle.

C. RECOMMENDATIONS FOR FURTHER RESEARCH

The need to conduct the proposed experimental EMT class is the logical recommendation of this study. The proposed experimental design and review of the neurological background supporting SALT's results should prove helpful in conducting this research. The Coast Guard continually finds itself in a personnel and budget restricted environment, any methods which hold the promise of reducing training time and expense should be evaluated.

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APPENDIX A

RECOMMENDED MUSICAL SELECTIONS FOR CONCERT PHASE OF SALT CYCLE

Selections following the (A) are from the Romantic period and are recommended for Concert 1. Selections following the (B) are from the Baroque period and are recommended for Concert 2.

1. (A) Joseph Haydn, Symphony No. 67 in F major, and No. 69 in B major. (B) Archangelo Corelli, Congerti Grossi, op. 4, 10, 11, 12.

2. (A) Joseph Haydn, Concerto for Violin and String Orchestra, No. 1 in C major, and No. 2 in G major. (B) J.S. Bach, Symphony in G minor, op. 6, No. 6: W.F. Bach, Symphony in D minor & C.P.E Bach, Symphony No. 2 for String Orchestra.

3. (A) W.A. Mozart--Haffner Symphony, Prague Symphony, German Dances. (B) G. Handel, Concerto for Organ and Orchestra; J.S. Bach, Choral Prelude in A major, and Prelude and Fugue in G minor.

4. (A) W.A. Mozart, Concerto for Violin and Orchestra, Concert No. 7 in D major. (B) J.S. Bach, Fantasy in C minor and Trio in D minor; Canonic Variations and Toccata.

5. (A) L.V. Beethoven, Concerto No. 5 in E flat for Piano and Orchestra, op. 73. (B) Antonio Vivaldi, Five Concertos for Flute and Chamber Orchestra.

6. (A) L.V. Beethoven, Concerto for Violin and Orchestra in D major. (B) A. Corelli, Concerto Grosso, op. 6 No. 3,5,8,9.

7. (A) P.I. Tchaikovsky, Concerto No. 1 in B flat mino for Piano and Orchestra. (B) G.F. Handel, the Water Music.

8. (A) J. Brahms, Concerto for Violin and Orchestra in D major, op. 77. (B) F. Couperin, Le Parnesse et l'Astree, Sonata in G minor; J.P. Rameau, Pieces de Clavecin No. 1, 5.

9. (A) F. Chopin, Waltzes. (B) G.F. Handel, Concerto Grosso, op. 3 No. 1,2,3,5.

10. (A) W.A. Mozart, Concerto for Piano and Orchestra No. 18 in B flat major. (B) A. Vivaldi, The Four Seasons.

This list was reproduced from Racle, Gabriel L., "Music, Pedagogy, Therapy: Suggestopedia", The Journal of Suggestive-Accelerative Learning and Teaching, 1979, (4) 3, p. 144.

Commercially prepared tapes with selections for the concert sessions are also available from:

1) Inner Dimension Research Foundation, P.O. Box 496, Santa Cruz, Ca. 95061

2) The LIND Institute, P.O. Box 14487, San Francisco, Ca. 94114.

APPENDIX B

CURRENT TERMINAL PERFORMANCE SKILL AND KNOWLEDGE OBJECTIVES TIME SUMMARY (HRS)

UNIT 1 INTRODUCTION TO THE EMERGENCY MEDICAL SYSTEM
LECTURE: 0.50 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 0.58 TOTAL: 1.08

UNIT 2 ANATOMY AND PHYSIOLOGY
LECTURE: 3.50 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 1.34 TOTAL: 4.95

UNIT 3 PATIENT EXAMINATION
LECTURE: 2.00 PRACTICAL: 4.50 FILMS: 0.00
EXAM: 3.32 TOTAL: 9.82

UNIT 4 CARDIAC
LECTURE: 2.00 PRACTICAL: 0.10 FILMS: 0.00
EXAM: 0.72 TOTAL: 2.82

UNIT 5 RESPIRATORY DISEASES
LECTURE: 2.50 PRACTICAL: 0.10 FILMS: 0.00
EXAM: 0.62 TOTAL: 3.22

UNIT 6 BASIC CARDIAC LIFE SUPPORT (BCLS)
LECTURE: 1.08 PRACTICAL: 7.00 FILMS: 0.42
EXAM: 2.33 TOTAL: 10.83

UNIT 7 AIRWAY MANAGEMENT
LECTURE: 0.00 PRACTICAL: 3.59 FILMS: 0.00
EXAM: 1.65 TOTAL: 5.24

UNIT 8 SOFT TISSUE INJURIES
LECTURE: 1.50 PRACTICAL: 3.34 FILMS: 0.00
EXAM: 1.78 TOTAL: 6.62

UNIT 9 BURN MANAGEMENT
LECTURE: 1.08 PRACTICAL: 0.10 FILMS: 0.42
EXAM: 0.79 TOTAL: 2.39

UNIT 10 ENVIRONMENTAL INJURIES
LECTURE: 1.00 PRACTICAL: 0.60 FILMS: 0.00
EXAM: 0.69 TOTAL: 2.29

UNIT 11 FRACTURES AND DISLOCATIONS
LECTURE: 2.62 PRACTICAL: 4.34 FILMS: 0.38
EXAM: 2.08 TOTAL: 9.42

UNIT 12 SHOCK
LECTURE: 1.38 PRACTICAL: 1.60 FILMS: 0.62
EXAM: 2.29 TOTAL: 5.89

UNIT 13 HOSPITAL EMERGENCY ROOM EXPERIENCE
LECTURE: 1.00 PRACTICAL: 10.00 FILMS: 0.00
EXAM: 0.00 TOTAL: 11.00

UNIT 14 SKULL AND SPINE INJURIES
LECTURE: 2.00 PRACTICAL: 0.60 FILMS: 0.00
EXAM: .86 TOTAL: 3.46

UNIT 15 DIABETIC EMERGENCY
LECTURE: 1.00 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.72 TOTAL: 1.81

UNIT 16 SEIZURES
LECTURE: 0.22 PRACTICAL: 0.09 FILMS: 0.28
EXAM: .22 TOTAL: 0.81

UNIT 17 STROKES
LECTURE: 0.50 PRACTICAL: 0.09 FILMS: 0.22
EXAM: 0.81 TOTAL: 0.81

UNIT 18 EMOTIONAL ASPECTS OF TRAUMA
LECTURE: 1.60 PRACTICAL: 0.00 FILMS: 0.40
EXAM: 0.35 TOTAL: 2.35

UNIT 19 ACUTE ABDOMEN
LECTURE: 1.00 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.76 TOTAL: 1.85

UNIT 20 OBSTETRICAL PROBLEMS AND EMERGENCY CHILDBIRTH
LECTURE: 2.66 PRACTICAL: 0.00 FILMS: 0.34
EXAM: 1.35 TOTAL: 4.35

UNIT 21 PATIENT HANDLING
LECTURE: 0.00 PRACTICAL: 7.50 FILMS: 0.00
EXAM: 0.71 TOTAL: 8.21

UNIT 22 DIVE INJURIES
LECTURE: 1.00 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.33 TOTAL: 1.42

UNIT 23 HYPOTHERMIA AND NEAR DROWNING
LECTURE: 2.33 PRACTICAL: 0.09 FILMS: 0.67
EXAM: 1.19 TOTAL: 4.28

UNIT 24 IN-WATER RESCUE/CPR
LECTURE: 1.42 PRACTICAL: 5.00 FILMS: 0.58
EXAM: 0.58 TOTAL: 7.58

UNIT 25 POISONS, BITES, AND STINGS
LECTURE: 1.50 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.21 TOTAL: 1.80

UNIT 26 COMMUNICATION AND VOICE REPORTS
LECTURE: 0.59 PRACTICAL: 0.00 FILMS: 0.41
EXAM: 0.54 TOTAL: 1.54

UNIT 27 TRIAGE
LECTURE: 2.00 PRACTICAL: 4.00 FILMS: 0.00
EXAM: 0.54 TOTAL: 6.54

UNIT 28 LEGAL ASPECTS OF THE EMS
LECTURE: 1.00 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 0.12 TOTAL: 1.12

TOTALS
LECTURE: 38.98 PRACTICAL: 53.00 FILMS: 4.52
EXAM: 27.00 TOTAL: 123.50

NOTE: HOSPITAL EXPERIENCE TIME IS PERFORMED AFTER HOURS AND ON WEEKENDS.

IN CLASS TIME TOTALS.....113.50
IN PROCESSING TIME..... 0.50
COMMANDING OFFICER TIME..... 0.50
OUT PROCESSING TIME..... 1.00
SCHOOL/COURSE INDOCTRINATION TIME.. 1.50
COURSE LENGTH IN HOUPS.....117.00

117.00 HRS = 2.925 WEEKS
40.00 HRS/WEEK

117.00 HRS = 14.625 DAYS
08.00 HRS/DAY

ACTUAL COURSE LENGTH IS 14 WORKING DAYS

APPENDIX C

CURRENT EMERGENCY MEDICAL TECHNICIAN SCHOOL CLASS SCHEDULE

SUNDAY	COURSE INTRODUCTION	1800
MONDAY	INTRODUCTION	0700-0730
	ANATOMY & PHYSIOLOGY	0730-0930
	ANATOMY & PHYSIOLOGY II	0930-1130
	VITAL SIGNS/MEDEVAC FORMS, & INITIAL PATIENT SURVEY (IPS)	1230-1430
	BLOOD PRESSURE & VITAL SIGNS	1430-1530
	PATIENT EXAMS (IPS)	1530-1630
TUESDAY	QUIZ	0700-0730
	CARDIAC PROBLEMS	0730-0900
	DYSPNEA	0900-1030
	BASIC CARDIAC LIFE SUPPORT	1030-1130
	OBSTRUCTED AIRWAYS	1230-1330
	CPR (1 MAN)	1330-1430
	CPR (2 MAN)	1430-1530
	SECONDARY PATIENT EXAM	1530-1630
	STUDY HALL	1800-2000
WEDNESDAY	SECTION TEST	0700-0800
	SOFT TISSUE INJURIES	0800-1030
	BURNS	1030-1130
	OXYGEN EQUIPMENT	1230-1330
	FLYNN VALVE	1330-1430
	BANDAGING I	1430-1530
	BANDAGING II	1530-1630
	STUDY HALL	1800-2000
THURSDAY	QUIZ	0700-0730
	FRACTURES & DISLOCATIONS	0730-0830
	ACUTE ABDOMEN	0830-0930
	SHOCK (FILM), MGMT OF SHOCK (FILM), & MAST	0930-1130
	BLOOD PRESSURE & SHOCK MGMT	1230-1330
	SPLINTING	1330-1430
	CPR (CHILD & INFANT)	1430-1530
	SMOCK ISSUE/HOSPITAL SCHEDULE	1530-1630
	STUDY HALL	1800-2000
FRIDAY	SECTION TEST	0700-0800
	SKULL & SPINE	0800-1000
	ENVIRONMENTAL INJURIES	1000-1030
	REEL SPLINT (FILM)	1030-1130
	CPR PRACTICAL EXAM & TRACTION SPLINTING	1230-1630

SUNDAY	STUDY HALL	1800
MONDAY	QUIZ	0700-0730
	STROKES & SEIZURES	0730-0830
	DIABETIC EMERGENCIES	0830-0930
	CLASS PHOTO	0930-1000
	EARLY LUNCH	1000-1130
	MID-TERM PRACTICAL EXAM	1230-1630
	STUDY HALL	1800-2000
TUESDAY	DECOMPRESSION ILLNESS	0700-0800
	EMERGENCY CHILDBIRTH, OB (FILM)	0800-1130
	STRETCHERS KED & L/S BOARD PATIENT HANDLING	1230-1600
	STUDY HALL	1800-2000
WEDNESDAY	QUIZ	0700-0730
	POISONS, BITES & STINGS	0730-0930
	HYPOTHERMIA/NEAR DROWNING (FILM)	0900-1100
	EXTRICATION, CPR W/FLYNN	1230-1630
	STUDY HALL	1800-2000
THUR	SECTION TEST	0700-0800
	VOICES & COMMS/SMALL SCENE MGMT	0800-1000
	CG WATER RESCUE TECHNIQUE (FILM)	1000-1115
	INWATER RESCUE EXERCISE	1200-1630
FRIDAY	QUIZ	0700-0730
	SKILLS EXAM	0730-1630
	STUDY HALL	1800-2000
SUNDAY	STUDY HALL	1800-2000
MONDAY	TWO RESCUER SMALL SCENCE MGMT CPR ON RUN	0730-1130
	CPR TAPE, EXTRICATION, VOICE REPORTS	1230-1630
	STUDY HALL	1800-2000
TUESDAY	SECTION TEST	0700-0800
	LEGAL ASPECTS OF TRAUMA	0800-0900
	TRIAGE	0900-1000
	MASS DISASTER PRACTICE	1230-1630
WEDNESDAY	SCENCE MGMT TEST (FINAL PRACTICAL)	0700-1630
THURSDAY	FINAL WRITTEN EXAM	0700-1030
	GRADUATION	1100-1200

APPENDIX D

U.S. COAST GUARD EMERGENCY MEDICAL TECHNICIAN SCHOOL COURSE INFORMATION

A. MISSION

The Emergency Medical Technician Course is designed to qualify members of the U.S. Coast Guard as Emergency Medical Technicians (Non-Ambulance). This includes all skills necessary for the individual to provide emergency medical care at a basic life support level with operational units of the U.S. Coast Guard.

Specifically, after successful completion of the program, the student will be capable of performing the following functions:

1. Recognize the nature and seriousness of the patient's condition or extent of his injuries to assess requirements for emergency care.
2. Administer appropriate emergency care to stabilize the patient's condition.
3. Lift, move, position and otherwise handle the patient in such a way as to minimize discomfort and further injury.

Successful completion of this course qualifies the student for the HD Qualification Code in accordance with the Coast Guard Enlisted Qualification Manual (COMDTINST M1414.8).

This course is equivalent to or exceeds the recommended standards for training Emergency Medical Technicians as

promulgated by the U.S. Department of Transportation. National Highway Traffic Safety Administration's Emergency Medical Technician Curriculum (Third Edition) DOT HS 075 MARCH 1984.

B. SCOPE

"The EMT's primary responsibility is to bring expert emergency medical care to the victims of emergencies and transport them safely and expeditiously to the proper facility." The EMT must accomplish these duties unsupervised. In a great variety of circumstances and often under considerable physical and emotional stress. The concept of an emergency medical technician, therefore, is of a person capable of exercising technical skills with authority and good judgment under difficult and stressful conditions. Personal qualities of stability, leadership and judgment are the primary prerequisites for selection. Due to the highly technical nature of this program, students should also possess good mechanical and reading skills.

Training will be for all Coast Guard personnel, regardless of rank or rate, who are actively engaged in Search and Rescue operations and who volunteer for this training. A remaining obligated service of at least one year upon completion of training is required.

C. TERMINAL PERFORMANCE SKILL AND KNOWLEDGE OBJECTIVES
ENABLING OBJECTIVES

UNIT #	UNIT NAME
1	INTRODUCTION TO THE EMERGENCY MEDICAL SYSTEM
2	ANATOMY AND PHYSIOLOGY
3	PATIENT EXAMINATION
4	CARDIAC
5	RESPIRATORY DISEASES
6	BASIC CARDIAC LIFE SUPPORT (BSLS)
7	AIRWAY MANAGEMENT
8	SOFT TISSUE INJURIES
9	BURN MANAGEMENT
10	ENVIRONMENTAL INJURIES
11	FRACTURES AND DISLOCATIONS
12	SHOCK
13	HOSPITAL EMERGENCY ROOM EXPERIENCE
14	SKULL AND SPINE INJURIES
15	DIABETIC EMERGENCY
16	SEIZURES
17	STROKES
18	EMOTIONAL ASPECTS OF TRAUMA
19	ACUTE ABDOMEN
20	OBSTETRICAL PROBLEMS AND EMERGENCY CHILDBIRTH
21	PATIENT HANDLING
22	DIVE INJURIES
23	HYPOTHERMIA AND NEAR DROWNING
24	IN-WATER RESCUE/CPR
25	POISONS, BITES, AND STINGS
26	COMMUNICATIONS AND VOICE REPORTS
27	TRIAGE
28	LEGAL ASPECTS OF THE EMS

D. TRAINING EQUIPMENT AND TRAINING AIDS

1. Classroom Equipment

cabinet, movie storage (1)
chair, student (36)
easel, instructor (1)
felt board (1)
flipchart, anatonical (1) set
liquid chalkboard (2)
pegboard (1)
podium (1)
rear screen projection system, includes
    projector, overhead (1)
    projector, 35 mm slide (1)
    projector, 16 mm movie (2)

recorder, sound on slide (1)
remote control unit (3)
stool, instructor (1)
table, demonstration, 2.5 X 6 feet (1)
table, desk, student (12)
video monitor (1)
video recorder/player (2)

2. LABORATORY EQUIPMENT

a. LAB #1
cabinet, moulage storage (1)
cabinet, seven drawer (1)
chair, student (3)
liquid chalkboard (1)
stand, manikin storage
storage bin, makeup (1)
stove, sink, refrigerator unit (1)

b. LAB #2
chairs, student (13)
compressed air system, includes:
air compressor
air lines
Flynn series III valves (3)
liquid chalkboard (1)
shelf unit, manniquin storage (1)

c. LAB #3
chairs, student, student (15)
couch (1)
flip chart, newsprint (1)
liquid chalkboard (1)
table, demonstration (1)
table, student desk type (1)

3. GENERAL TRAINING EQUIPMENT

airplane (1)
ambulance (1)
blankets (20)
boat (1)
cervical collars (18)
chart, anatomical series (1)
display board, airway management (1)
display board, CPR instructions (3)
display board, Flynn Series III (1)
display board, EMT kit (1)
display board, MAST (1)
display board, MEDVAC Report form (1)
display board, oropharyngeal airway (1)

display board, swimmers harness (1)
makeup kit, theatrical (2)
manikin, AMBU simulator (3)
manikin, CPR, anatomical (1)
manikin, CPR, adult, inflatable (1)
manikin, CPR, adult, recording (9)
manikin, CPR, infant (2)
manikin, intubation, adult (2)
manikin, thorax, cutaway (1)
medical airway management kit (4)
medical anit-shock trousers MAST (6)
medical bandage kit (12)
mirror, makeup (1)
moulage kit, strap-on (2)
oxygen administration kit, Flynn Series III (6)
oxygen tank, replacements (10)
ship compartment mockup (1)
skeleton, human (1)
spine board, Miller (2)
spine board, wooden, long (1)
spine board, aluminum, long (1)
spine board, wooden, short (1)
spine immobilizer, K.E.D. (3)
splint, Hare traction (6)
splint, Reel traction, adult (3)
splint, Reel traction, child (1)
splint, Thomas half-ring (1)
stretcher, ambulance gurney (1)
stretcher, army litter (6)
stretcher, build-a-board (3)
stretcher, Neil-Robertson (2)
stretcher, scoop (1)
stretcher, SKED (1)
stretcher, Stokes (6)

E. AUDIO-VISUAL TRAINING MATERIAL

1. 16 mm FILMS

CPR for Citizens (American Red Cross)
Emergency Management of Seizures
Going into Shock
Emergency O.B.
No Exceptions (A film about RAPE)
Everglades and After
Burn Emergency
Water the Timeless Compound
Mast (uses and application)
Drowning Facts and Myths
Man in Cold Water

2. SOUND ON SLIDE

Hypothermia

3. VIDEO TAPES

Hypothermia
Cold Water Near Drowning
Reel Splint

(EMT School currently in process of replacing 16mm with video tape)

F. FACILITIES AND SPACE REQUIREMENTS

Classroom (1)	50 x 20 ft	1000 SQ FT
Lab #1	19 x 18 ft	342 SQ FT
Lab #2	19 x 17 ft	323 SQ FT
Lab #3	19 x 19.5 ft	370 SQ FT
School Chief Office	19 X12.5 ft	237 SQ FT
Instructor's Office	30 x 19 ft	570 SQ FT
Storage Room (training aids)	12 x 11.5 ft	138 SQ FT
Storage Building	18 x 12 ft	216 SQ FT

APPENDIX E

PROPOSED TERMINAL PERFORMANCE SKILL AND KNOWLEDGE OBJECTIVES TIME SUMMARY (HRS)

UNIT 1 INTRODUCTION TO THE EMERGENCY MEDICAL SYSTEM
LECTURE: 0.25 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 0.58 TOTAL: 0.83

UNIT 2 ANATOMY AND PHYSIOLOGY
LECTURE: 1.75 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 1.34 TOTAL: 3.09

UNIT 3 PATIENT EXAMINATION
LECTURE: 1.00 PRACTICAL: 4.50 FILMS: 0.00
EXAM: 3.32 TOTAL: 8.82

UNIT 4 CARDIAC
LECTURE: 1.00 PRACTICAL: 0.10 FILMS: 0.00
EXAM: 0.72 TOTAL: 1.82

UNIT 5 RESPIRATORY DISEASES
LECTURE: 1.25 PRACTICAL: 0.10 FILMS: 0.00
EXAM: 0.62 TOTAL: 1.97

UNIT 6 BASIC CARDIAC LIFE SUPPORT (BCLS)
LECTURE: 0.54 PRACTICAL: 7.00 FILMS: 0.42
EXAM: 2.33 TOTAL: 10.29

UNIT 7 AIRWAY MANAGEMENT
LECTURE: 0.00 PRACTICAL: 3.59 FILMS: 0.00
EXAM: 1.65 TOTAL: 5.24

UNIT 8 SOFT TISSUE INJURIES
LECTURE: 0.75 PRACTICAL: 3.34 FILMS: 0.00
EXAM: 1.78 TOTAL: 5.87

UNIT 9 BURN MANAGEMENT
LECTURE: 0.54 PRACTICAL: 0.10 FILMS: 0.42
EXAM: 0.79 TOTAL: 1.85

UNIT 10 ENVIRONMENTAL INJURIES
LECTURE: 0.50 PRACTICAL: 0.60 FILMS: 0.00
EXAM: 0.69 TOTAL: 1.79

UNIT 11 FRACTURES AND DISLOCATIONS
LECTURE: 1.31 PRACTICAL: 4.34 FILMS: 0.38
EXAM: 2.08 TOTAL: 8.11

UNIT 12 SHOCK
LECTURE: 0.69 PRACTICAL: 1.60 FILMS: 0.62
EXAM: 2.29 TOTAL: 5.20

UNIT 13 HOSPITAL EMERGENCY ROOM EXPERIENCE
LECTURE: 0.50 PRACTICAL: 10.00 FILMS: 0.00
EXAM: 0.00 TOTAL: 10.50

UNIT 14 SKULL AND SPINE INJURIES
LECTURE: 1.00 PRACTICAL: 0.60 FILMS: 0.00
EXAM: .86 TOTAL: 2.46

UNIT 15 DIABETIC EMERGENCY
LECTURE: 0.50 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.72 TOTAL: 1.31

UNIT 16 SEIZURES
LECTURE: 0.11 PRACTICAL: 0.09 FILMS: 0.28
EXAM: 0.22 TOTAL: 0.70

UNIT 17 STROKES
LECTURE: 0.25 PRACTICAL: 0.09 FILMS: 0.22
EXAM: 0.81 TOTAL: 1.37

UNIT 18 EMOTIONAL ASPECTS OF TRAUMA
LECTURE: 0.80 PRACTICAL: 0.00 FILMS: 0.40
EXAM: 0.35 TOTAL: 1.55

UNIT 19 ACUTE ABDOMEN
LECTURE: 0.50 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.76 TOTAL: 1.35

UNIT 20 OBSTETRICAL PROBLEMS AND EMERGENCY CHILDBIRTH
LECTURE: 1.33 PRACTICAL: 0.00 FILMS: 0.34
EXAM: 1.35 TOTAL: 3.02

UNIT 21 PATIENT HANDLING
LECTURE: 0.00 PRACTICAL: 7.50 FILMS: 0.00
EXAM: 0.71 TOTAL: 8.21

UNIT 22 DIVE INJURIES
LECTURE: 0.50 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.33 TOTAL: 0.92

UNIT 23 HYPOTHERMIA AND NEAR DROWNING
LECTURE: 1.17 PRACTICAL: 0.09 FILMS: 0.67
EXAM: 1.19 TOTAL: 3.12

UNIT 24 IN-WATER RESCUE/CPR
LECTURE: 0.71 PRACTICAL: 5.00 FILMS: 0.58
EXAM: 0.58 TOTAL: 6.87

UNIT 25 POISONS, BITES, AND STINGS
LECTURE: 0.75 PRACTICAL: 0.09 FILMS: 0.00
EXAM: 0.21 TOTAL: 1.05

UNIT 26 COMMUNICATION AND VOICE REPORTS
LECTURE: 0.30 PRACTICAL: 0.00 FILMS: 0.41
EXAM: 0.54 TOTAL: 1.25

UNIT 27 TRIAGE
LECTURE: 1.00 PRACTICAL: 4.00 FILMS: 0.00
EXAM: 0.54 TOTAL: 5.54

UNIT 28 LEGAL ASPECTS OF THE EMS
LECTURE: 0.50 PRACTICAL: 0.00 FILMS: 0.00
EXAM: 0.12 TOTAL: 0.62

TOTALS
LECTURE: 19.50 PRACTICAL: 53.00 FILMS: 4.52
EXAM: 27.00 TOTAL: 104.02

NOTE: HOSPITAL EXPERIENCE TIME IS PERFORMED AFTER HOURS AND ON WEEKENDS.

IN CLASS TIME TOTALS.....94.02
IN PROCESSING TIME..... 0.50
COMMANDING OFFICER TIME..... 0.50
OUT PROCESSING TIME..... 1.00
SCHOOL/COURSE INDOCTRINATION TIME.. 1.98
COURSE LENGTH IN HOURS.....98.00

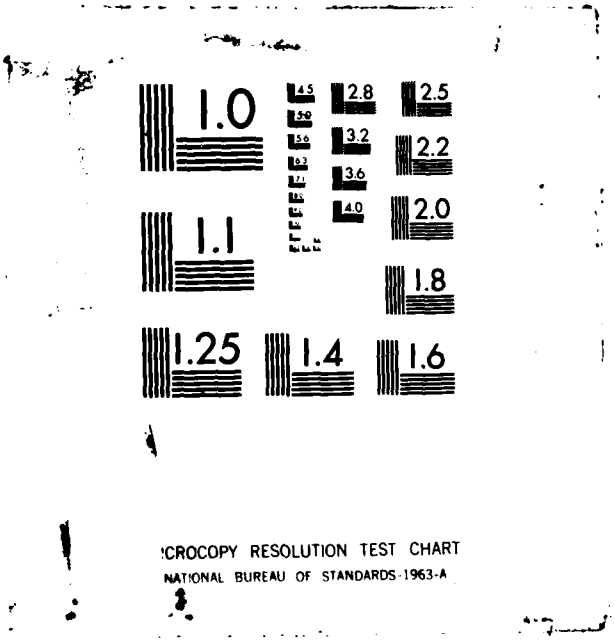
98.00 HRS = 2.45 WEEKS (40.00 HRS/WEEK)

98.00 HRS = 12.25 DAYS (08.00 HRS/DAY)

ACTUAL COURSE LENGTH REDUCED FROM 14 TO 12 WORKING DAYS

AD-A173 585 AN IMPLEMENTATION GUIDE FOR THE EXPERIMENTAL APPLICATION OF SUGGESTIVE-AC (U) NAVAL POSTGRADUATE SCHOOL MONTEREY CA J D WILLIAMSON JUN 86 2/2

UNCLASSIFIED F/G 5/10 NL



APPENDIX E

PROPOSED CLASS SCHEDULE FOR EMERGENCY MEDICAL TECHNICIAN SCHOOL SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING APPLICATION EXPERIMENT

SUNDAY	COURSE INTRODUCTION	1800
MONDAY	INTRODUCTION TO SALT & RELAXATION EXERCISE	0700-0730
	INTRODUCTION TO EMS	0730-0800
	ANATOMY & PHYSIOLOGY	0800-0930
	PATIENT EXAMS (IPS) LECTURE	0930-1015
	VITAL SIGNS/MEDEVAC FORMS, & INITIAL PATIENT SURVEY (IPS)	1015-1030
	CONCERT REVIEW OF MATERIAL	1030-1130
	BLOOD PRESSURE & VITAL SIGNS	1230-1330
	PATIENT EXAMS (IPS) PRACTICAL	1330-1500
	SECONDARY PATIENT EXAM PRACTICAL	1500-1630
TUESDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	CARDIAC PROBLEMS	0745-0830
	DYSPNEA	0830-0945
	BASIC CARDIAC LIFE SUPPORT	0945-1030
	CONCERT REVIEW	1030-1130
	OBSTRUCTED AIRWAYS	1230-1330
	CPR (1 MAN)	1330-1430
	CPR (2 MAN)	1430-1530
	CPR (CHILD & INFANT)	1530-1630
	STUDY HALL	1800-2000
WEDNESDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	SOFT TISSUE INJURIES	0745-0820
	BURNS	0820-0910
	ACUTE ABDOMEN	0930-1000
	ENVIRONMENTAL INJURIES	1000-1030
	CONCERT REVIEW	1030-1130
	OXYGEN EQUIPMENT	1230-1330
	FLYNN VALVE	1330-1430
	BANDAGING I	1430-1530
	BANDAGING II	1530-1630
	STUDY HALL	1800-2000

THURSDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	FRACTURES & DISLOCATIONS	0745-0850
	SKULL & SPINE	0850-0930
	SPLINTING	0930-1000
	BLOOD PRESSURE & SHOCK MGMT	1000-1030
	CONCERT REVIEW	1030-1130
	SHOCK (FILM), MGMT OF SHOCK (FILM), REEL SPLINT (FILM) & MAST	1230-1400
	CPR PRACTICAL EXAM & TRACTION SPLINTING	1400-1630
	STUDY HALL	1800-2000
FRIDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	DECOMPRESSION ILLNESS	0745-0810
	EMERGENCY CHILDBIRTH, OB (FILM)	0810-0910
	STROKES & SEIZURES	0910-0930
	DIABETIC EMERGENCIES	0930-0950
	CONCERT REVIEW	0950-1050
	EARLY LUNCH	1050-1130
	MID-TERM PRACTICAL EXAM	1230-1600
	SMOCK ISSUE/HOSPITAL SCHEDULE	1600-1630
	STUDY HALL	1800-2000
SUNDAY	STUDY HALL	1800-2000
MONDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	STRETCHERS, KED, L/S BOARD, PATIENT PATIENT HANDLING, EXTRICATION, & CPR W/FLYNN	0745-1030
	CONCERT REVIEW	1030-1130
	STRETCHERS, KED, L/S BOARD, PATIENT PATIENT HANDLING, EXTRICATION, & CPR W/FLYNN PRACTICAL	1230-1630
	STUDY HALL	1800-2000
TUESDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	POISONS, BITES & STINGS	0745-0815
	HYPOTHERMIA/NEAR DROWNING FILM	0815-0915
	CG WATER RESCUE TECHNIQUE (FILM)	0915-1030
	CONCERT REVIEW	1030-1130
	INWATER RESCUE EXERCISE	1230-1630
	STUDY HALL	1800-2000

WEDNESDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	LEGAL & EMOTIONAL ASPECTS OF TRAUMA	0745-0845
	TRIAGE	0845-0915
	VOICES & COMMS/SMALL SCENE MGMT	0915-1030
	CONCERT REVIEW	1030-1130
	CPR TAPE, EXTRICATION, VOICE REPORTS	1230-1630
	STUDY HALL	1800-2000
THURSDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	TWO RESCUER SMALL SCENCE MGMT CPR ON RUN	0745-1130
	MASS DISASTER PRACTICE	1230-1630
	STUDY HALL	1800-2000
FRIDAY	RELAXATION EXERCISE	0700-0715
	QUIZ	0715-0745
	SKILLS EXAM	0745-1630
SUNDAY	STUDY HALL	1800-2000
MONDAY	SCENCE MGMT TEST (FINAL PRACTICAL)	0700-1630
TUESDAY	FINAL WRITTEN EXAM	0700-1030
	GRADUATION	1100-1200

APPENDIX G

EXAMPLES OF GUIDED IMAGERY TO BE USED IN THE PRECLASS RELAXATION EXERCISES

A guided imagery exercise is narrated by the instructor over a Baroque period musical selection. These exercises are designed to allow the student to relax and recall an early pleasant learning experience. The use of this technique will help the instructor to begin each class with a positive suggestive set-up. Following the imagery the students should standup and stretch before proceeding with the prelude/decoding stage of the SALT cycle. Two examples of this phase of the SALT cycle are provided below. Short pauses (1-3 seconds) to allow visualization are indicated by the ellipsis marks in the narration.

A. GUIDED IMAGERY I

Close your eyes and settle easily into your seat. . . while you feel the temperature of the air and hear sounds around you. . .you may experience a thought and perhaps imagine the seashore and yourself walking along the beach you may hear the breakers. . .or even smell the salty air while you enjoy the scene. . .and perhaps lie down in the warm sand and feel comfortable and content with yourself. . .while beauty surrounds you as you float on the sound of waves licking the shore. . .and you see a gull flying overhead

against a perfectly blue sky. . .you may even see the gull flying effortlessly with wings outstretched and motionless . . .or perhaps you even become the gull as you peacefully float on a breeze. . .and feel so relaxed and calm. . .now you look down from above and you may notice a person, a scholar studying and learning easily and wonder why they are studying at the beach. . .but perhaps you admire how focused that person is, as well as how easily they can recall information. . .and you wonder who this person is, but as you look closer you realize that this person is actually you . . .possibly your unconscious self. . .a friend who is willing to help you learn quickly and easily. . .finally as you become this person you thank yourself in peaceful gratitude and slowly return to the present.

B. GUIDED IMAGERY II

Now sit comfortably, easily and close your eyes. . .you are listening to the sound of my voice as you feel the chair pressing against your body and you become aware of your breathing which causes you to feel more inner peace. . .now imagine you are slowly walking up a hill just before sunrise. . .as you become more relaxed you may notice the colors in the sky. . .or perhaps the sound of a nearby creek you may even feel the cool morning air on your skin. . .and a sense of eagerness to see the sunrise. . .as you reach the top of ther hill perhaps you hear the song of morning birds

as the first golden rays of sunlight burst over the horizon . . .which makes you feel so alive and at peace with yourself . . .now journey back in time to an experience where learning was fun and exciting, maybe a book or movie where you were so absorbed that you could hardly wait to know what was going to happen or maybe the first time you could ride a bike or swim by yourself. . .just some experience where you learned well and had fun learning. . .you may feel yourself feeling emotions from that experience. . .and perhaps you are becoming aware of sensations in your body. . .you may remember the music of a favorite song or even the taste of a favorite snack as you realize the more fun you allow learning to be. . .the better your memory and understanding. . .you may notice an increasing sense of delight with anything you would like to learn now. . .as you begin discovering yourself learning as well. . .and having as much fun as you had in this experience. . .now take a few seconds to slowly open your eyes and return to the present.

These examples of mind calming and recall of an early pleasant learning experience are reproduced from a cassette tape entitled Mind Calming: Metronome Timing available from Inner Dimension Reasearch Foundation, P.O. Box 496, Santa Cruz, CA. 95061

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